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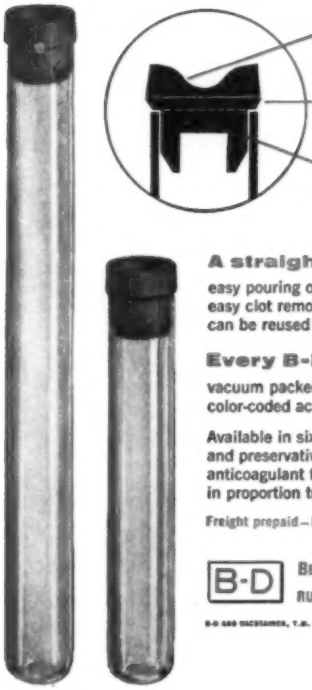

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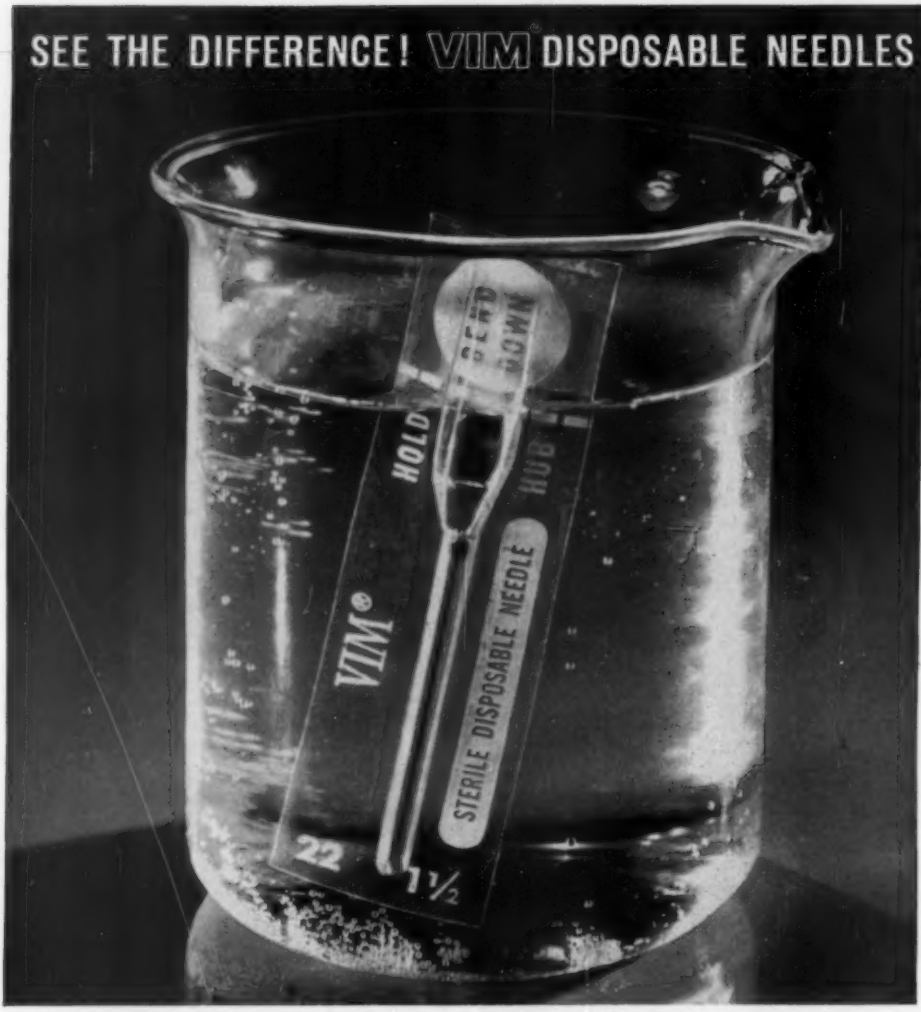

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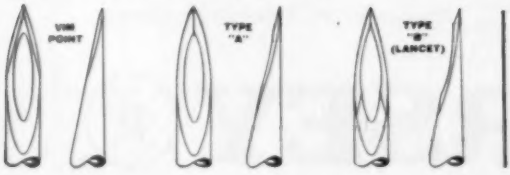

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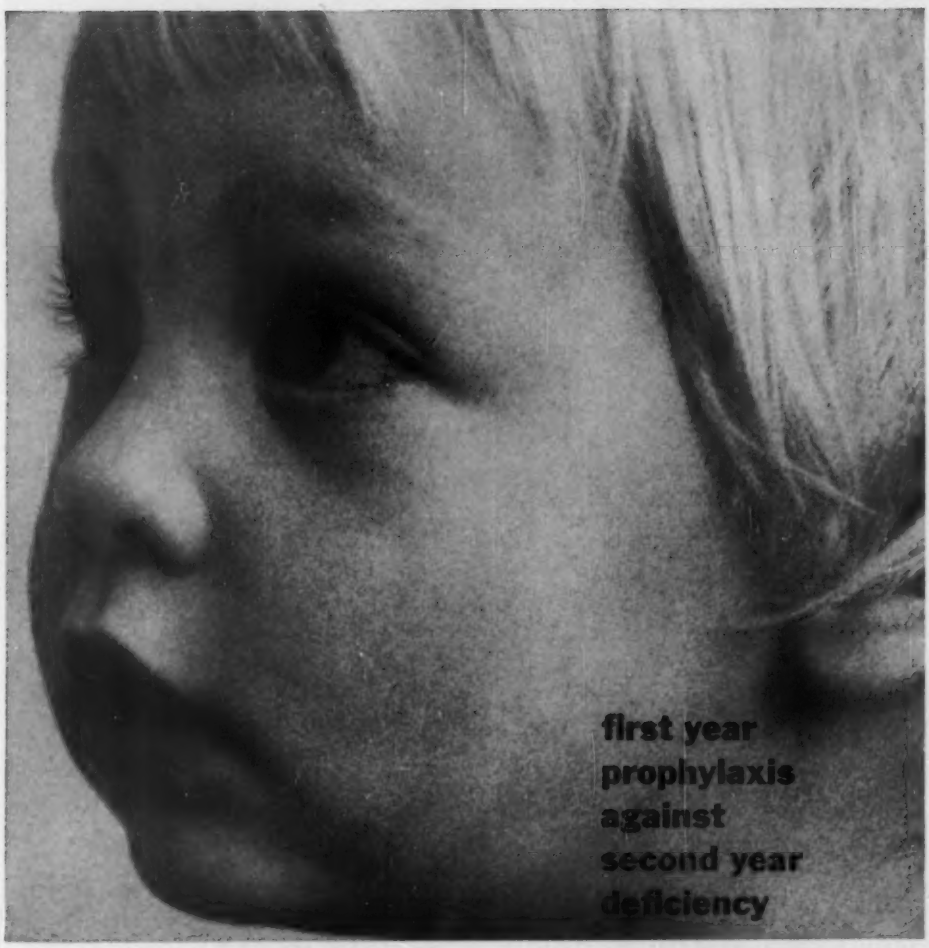

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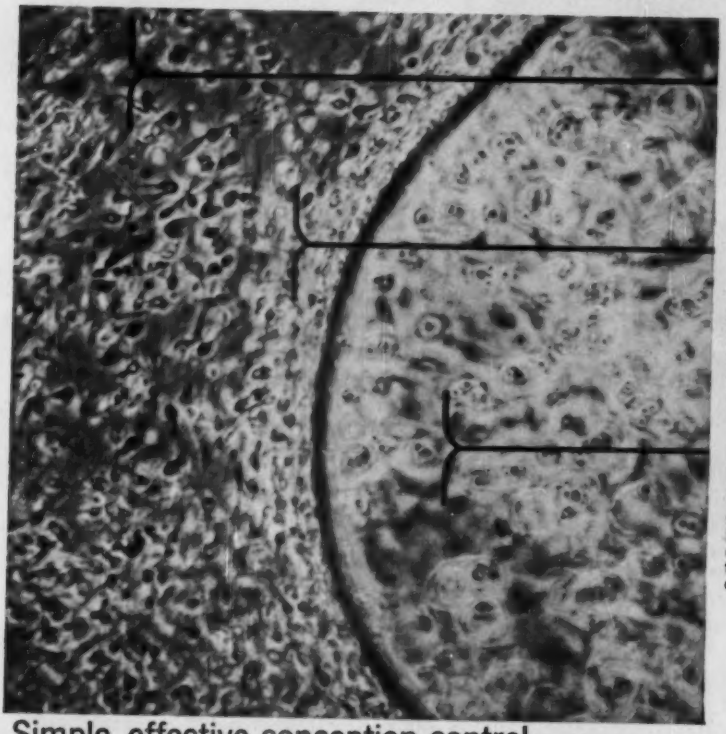

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1. Goldstein, L. Z.: Obst. & Gynec. 10:133 (Aug.) 1957.
2. Finkelstein, R., and Goldberg, R. B.: Am. J. Obst. & Gynec. 78:657 (Sept.) 1959.

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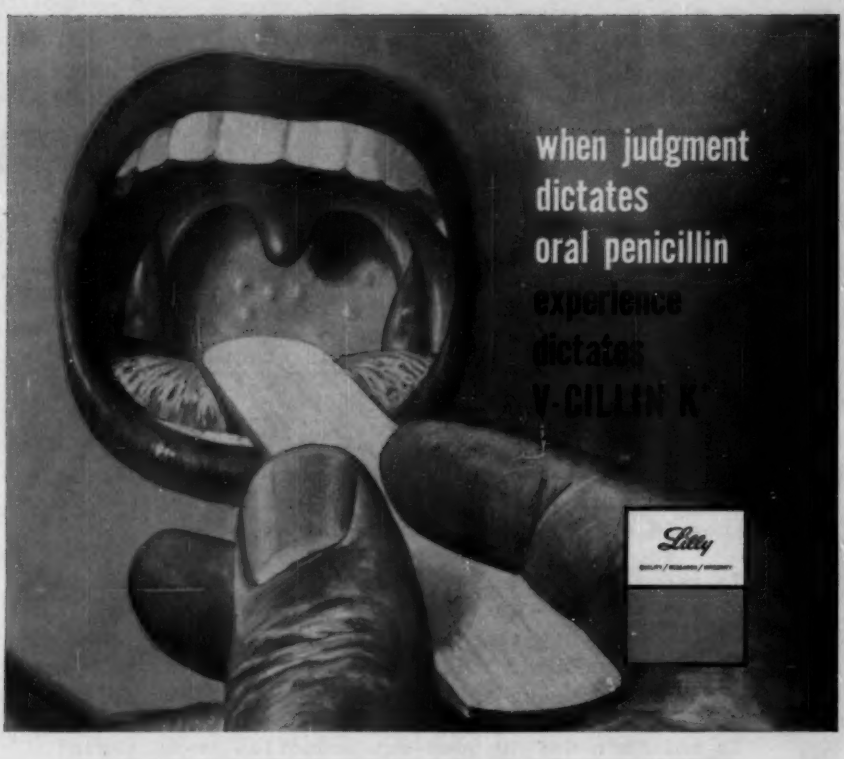

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1. Griffith, R. S.: Comparison of Antibiotic Activity in Sera Following the Administration of Three Different Penicillins, Antibiotic Med. & Clin. Therapy, 7:No. 2 (February), 1960.

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Journal of Public Health

The public health laboratory was a distinctive American innovation in providing a suitable scientific tool for the implementation of the public health program, particularly in the control of communicable disease. This forecast by a perspicacious public health leader indicates what tasks face the public health laboratory in a period concerned with medical care, chronic illness, air pollution and the like.

THE PUBLIC HEALTH LABORATORY— LOOKING TO THE FUTURE

Albert V. Hardy, M.D., F.A.P.H.A.

AT THE FALL MEETING of the Association of State and Territorial Health Officers, in 1959, one full session was devoted to long-range planning. The draft report under consideration began as follows: "This Association is convinced that long-range planning is an essential part of sound public health administration in state and local health departments. In the press of current duties it is too commonly neglected." This need, recognized for our health departments as a whole, applies equally to its component parts. Plans designed to attain accepted objectives should be the result of a blending of plans for each of the operating activities involved. It is timely to look to the future of the Public Health Laboratory, and of the Laboratory Section, and to consider the place of long-range planning in attaining desired goals.

Planning involves an analysis of current and foreseeable problems, projections, as of population change, and the design of programs to meet anticipated needs. In this country there are local, state, and regional variations in the nature of problems, in the rate and types of change, and in economic and personnel resources. It is considered basic that health services should be planned, organized, and provided from a level as close as practicable to those to be served. National organizations may stimulate and guide, and national agencies can be prepared to assist, including the provision of those services which

can be provided best and economically on a national basis. However, the long-range planning of public health and public health laboratory services is to be regarded as a primary responsibility of state and local organizations.

Planning for the public health laboratory cannot proceed effectively without prior planning for public health as a whole. Broad objectives must be defined, priorities considered, and budgetary possibilities weighed. Such broad decisions largely determine the course of public health development. This overall planning should be the product of group thinking, involving the chief of the laboratory, as of other major services.

Considering public health as a whole impending changes are apparent. But in the haze of the future different observers will have different impressions. In this report those developments which appear to the author to have important implications for the laboratory will be given attention. The hope is that by "Looking to the Future" we may be able to plan better for it.

Despite early reservations, it is now widely accepted that "Medical Care" has an expanding future in public health. There is an increasing concern with the administration of medical care for the indigent, with home nursing services and with rehabilitation. Hospital licensure programs and grants for the construction of hospitals, health centers, and research facilities are administered through health departments. More and more those in public health are being involved in problems related to medical care. In this, consideration of laboratory services and facilities is inevitable, and the participation of those trained in the laboratory is indicated.

Until recently medical care was considered to be the prerogative of the private practitioner. Through social pressure, hospitalization and medical care are being made available at group or public expense for an expanding proportion of the population. Initially, public health was reluctant to become involved where it might be considered to be a competitor of private medicine. Now there is pressure from organized medicine itself for public health to assume responsibility for the administration of programs of medical care for the indigent. In our state, for example, it was the State Medical Society which insisted to the legislature that the administration of the expanded program for the hospitalization of the indigent should be in the State Board of Health, not in the State Department of Public Welfare. Under these conditions public health is allied with organized medicine in its "Medical Care" activities. This change in attitude toward public health from possible competitor to ally is emphasized, since heretofore the public health laboratory has been regarded in some degree as a competitor of the clinical laboratory. There is the emerging prospect that we may in the future become a co-worker in providing more and better laboratory service to the indigent, and to the public as a whole.

The problems in providing laboratory services for the indigent are apparent even though the solutions are obscure. Public funds for the provision of hospitalization and medical care to the indigent are less than adequate to meet acknowledged needs and the cost of indicated laboratory services is an important item in the increasing cost of this care. The value of laboratory services varies with the dependability of findings, and procedures to better assure a high quality of service are not as widely applied as is desirable. Equally important fully qualified personnel are not available in the numbers needed to provide the volume of services required. The solution of these problems must be a future concern of public health laboratories.

First and of high importance we need

to attain the position of co-worker rather than competitor of the clinical laboratories. In the provision of services to the indigent we can be ready to assist. There is the budgetary necessity of providing these at the basic cost and the private laboratory may wish to be relieved of some portion of this work. Solutions will differ widely but this service provided at public expense should be acknowledged as a problem of the publicly supported laboratory as it is also of the clinical laboratory.

We are aware both of the importance of assuring that test results are highly dependable and of the laborious effort needed to attain this objective. The serological test for syphilis is well standardized but this receives the attention of a substantial federal organization and an active program in many if not all of our state public health laboratories. The need for and value of comparable education, consultation, standardization, and evaluation for other test procedures is apparent. This is a problem for which long-range planning is needed.

The training of laboratory workers warrants and received consideration during one full session at the meeting of the Conference of State and Provincial Public Health Laboratory Directors. Expanded training facilities clearly are needed. For the future it may be hoped that the rich resources for training in bacteriology, parasitology, and serology in our public health laboratories will be used in a more effective manner. This will involve negotiations and planning at the national as well as at state and local levels.

Thus there are important ways in which the public health laboratory can contribute to the medical care programs of health departments, but there will need to be effective planning if this is to be attained.

An increasing emphasis on the chronic diseases and disabilities is a second major trend in public health. In less than two decades the research arm of the public health service has been transformed from one concerned in large part with acute infectious diseases, to a group of institutes directing attention predominantly to chronic diseases and disabilities. As methods to prevent the development or progression of these diseases become available there will be a public demand for their application. It may be expected that public health services, as has been true of research, will be reorientated to the chronic diseases.

Current public health programs in this field are in an early developmental phase. The laboratory needs are not yet foreseeable. Still the objectives are such that it appears probably that the current concern of the public health laboratory with the infectious diseases will be replaced by a concern for chronic illnesses. A present hope in chronic disease programs is for early detection of those individuals who are predisposed or who have early lesions, so that effective prophylactic and therapeutic management may be instituted. The need is for objective tests which may be performed in large numbers at modest cost. A model for the type of program desired is the mass screening for syphilis. Diabetes case finding and cancer detection through Papanicolaou smears are early but laborious developments. The present challenge to the public health laboratory is to aid in the development of effective procedures for mass testing. With its early active concern for the detection of cases and carriers of infectious diseases, new or better diagnostic technics have evolved; as we look to our future, attention will need to be focused similarly on tests needed in the chronic disease programs. The same favorable development may be anticipated.

Another problem of general concern is the "fragmentation" of public health services. There is the related determination to plan better for a consolidation of these activities. Medical care and

medical rehabilitation, for example, are being administered by Departments of Public Welfare and Vocational Rehabilitation, community programs in mental health are being conducted by other than public health agencies, and new agencies are being created to carry on new public health programs, as for example for the rehabilitation of alcoholics or for the study and control of air pollution. Our critics say this is so since public health is neither prepared nor willing to accept new responsibilities.

There has been a comparable tendency toward the fragmentation of laboratory services within our own health departments. In my state, for example, laboratory service in connection with industrial hygiene is performed by chemists employed by that division, biological and chemical tests utilized in sewage disposal and water pollution studies are conducted in laboratories attached to the Bureau of Sanitary Engineering, entomological laboratory studies are in another bureau and the laboratory work in connection with radiological health has still another home. In my opinion this common condition is not the result of any reluctance of the laboratory to prepare for and initiate new services. The root of the problem is in the assignment of categorical funds. When federal funds became available for industrial hygiene all of these were assigned to the newly formed division. Even if facilities for needed laboratory work had been available in the Bureau of Laboratories the resources were not provided to obtain personnel. It is not my contention that without exception all laboratory service should be provided from a bureau of laboratories. However, on this problem we can have certain firm convictions. The centralization of laboratory services of similar type favors economy and a more effective use of senior supervisory personnel. Consolidation must be justified by the capacity to provide better services. Also, with consolidation there must be an effective association between those in the laboratory and those responsible for the service activities.

There is an objection to the fragmentation of health services among multiple agencies; we who are interested in the laboratory have a similar reaction concerning the fragmentation of laboratory services. This is a trend to be resisted and reversed. It is our place to urge that the provision of laboratory services should be the work of the bureau established to provide such services. It is our responsibility to be ready to modify programs, to add new skills, and to be able to handle added work in a superior manner. We must also convince the administrator that this is the economical arrangement and that general and categorical budgets must be equitably distributed to provide for such new services.

The most recent demand for new testing procedures has been in the field of radiological health. The responsibility for laboratory procedures will be assigned in accordance with interest and competence. If further fragmentation of laboratory services is to be avoided, and if consolidation is to be encouraged there must be demonstrated interest and a readiness to expand the area of competence of those serving in the laboratory. Planning to limit "fragmentation" and to favor consolidation of laboratory services will be in line with the planning for public health as a whole.

There has been in recent years a vast expansion in laboratory and clinical research. There has not been a comparable development of epidemiological field studies. There appears to be an increasing appreciation of the need for a better balance between research in the field and that in the laboratory and in the clinic. There is reason to expect that in the future as in the past, health departments will become geared to research and will again contribute

uniquely through community centered studies.

The public health laboratory has a creditable record in research. But today there is a wide tendency to differentiate the research laboratory from the public health and clinical "service" laboratory. However, experience has established that public health laboratory services often are the beginning point for productive field studies. Utilizing such readily available opportunities, those in the laboratory in partnership with the epidemiologist can readily proceed with productive studies. Looking to the future our research in the laboratory should be planned to utilize such unique opportunities available to public health.

Lastly in long-range planning for public health as a whole there is acceptance of the idea, that with broad expansion in new areas, possible contraction in other programs must be considered. In some activities, the adjustment is natural and painless. With the growing need for chronic disease hospitals, for example, there is a decreasing demand for hospital beds for tuberculosis. So, too, in the laboratory it will be necessary to consider the possibility of providing for services for which there is a new demand by a reduction of those for which there is decreasing need.

It must be acknowledged that the submission of specimens becomes a routine. I recall, for example, our concern over a heavy load of malaria smears which continued to be submitted after indigenous cases in the South were almost unknown. On examination of records it was found that these specimens came from relatively few physicians. Contacting one by phone he revealed that he did not appreciate that these were still being submitted routinely by his nurse on all febrile disorders. A testing procedure, which had been initiated when malaria was a common cause of febrile illness, was being continued as a routine beyond the duration of its usefulness. Through such inquiries the daily work of a microscopist was almost eliminated, with a feeling of loss by the worker and the laboratory division concerned. There was also a reduction in the number of tests performed as shown in the monthly and annual reports. It was clear that the importance of the activity was being measured by numbers, not by the public health significance of the work performed. There would be much less resistance to the contraction of older programs if the number of tests did not have such a prominent place in the reporting of laboratory activities.

Unquestionably the need for some laboratory services is declining. Currently the value of premarital blood tests is being questioned. Is there still the need for the large number of blood samples for serological tests for syphilis which are submitted routinely? Considering the present high bacteriological quality of dairy products, and the usual control in the processing plant laboratories, is there justification for submitting samples on a schedule established by regulation when the product was often of poor quality and when there were no control laboratories in the industry? The submission of parasitological samples in the South, to a degree, continues to be a mass screening for hookworm infection, but is this needed today? Fecal cultures on food handlers may be no longer justified, but some laboratories are burdened by these tests which are required by a static system of regulation. These are illustrative. Each of you could add other examples. The public health need for laboratory services is changing markedly. With plans for new services, there must also be plans for reduction in services which are declining in importance.

At this sixtieth anniversary of the founding of the Laboratory Section we should possibly be looking to the future of the section rather than that of the laboratory. But are not the two in-

separably intertwined? Reports offered indicate present interests. Measured in this way it is evident that the concern is still with infectious diseases, particularly virus diseases, also with the quality control of water and milk. It may be of more significance, however, that this year in the conference or in the Section there is a recognition of the interest of the public health laboratory in chronic disease, clinical chemistry, air pollution and radiological health. However, it can hardly be claimed that the Section is providing strong leadership in preparing for a modified future. Should this not be an important future function of our Section?

At the recent meeting of the Florida Public Health Association our state health officer, Dr. Wilson T. Sowder, presented a paper on long-range planning for public health in Florida. He pointed out that in 1873 plans were evolved for establishing a state public health organization. The proponents undoubtedly were discouraged when their first legislative proposal for an appropriation of $200 to establish a health program was defeated because the amount was considered exorbitant. But for 16 years the plan was repeatedly recommended by the Medical Association, the governors, and concerned citizens. The convincing argument was the occurrence of an epidemic of yellow fever. It was also mentioned that the first state health officer, Dr. J. Y. Porter, in 1892 recommended legislative authorization for the collection of data regarding births, deaths, and marriages, but it was 23 years before this sound plan was adopted and two more years before a Bureau of Vital Statistics could be established. Dr. Sowder emphasized that long-range planning for public health is not new. Furthermore, sound plans may not become a reality immediately. It may seem a dream to think of the time when the public health laboratory would be welcomed as an ally of the clinical laboratory, or when our major concern would be with problems of chronic rather than infectious diseases. Though changes in this era come with an increasing tempo, still we, as was true of our forebears, should dream and plan, but be patient and persistent in moving toward our goals.

Dr. Hardy, formerly director of laboratories, is now assistant state health officer, Florida State Board of Health, Jacksonville, Fla.

This paper was presented before the Laboratory Section of the American Public Health Association at the Eighty-Seventh Annual Meeting in Atlantic City, N. J., October 19, 1959.

That the future has already arrived is the moral of this report. What happens to the public health laboratory when the State Health Department begins to deal with air pollution? Here is the story in one large state.

THE ROLE OF THE PUBLIC HEALTH LABORATORY IN AIR POLLUTION PROGRAMS

Harold L. Helwig, Ph.D., and John A. Maga, M.S.

AIR POLLUTION activities are relatively recent additions to public health programs. Traditional environmental sanitation in public health has embraced food, water, and shelter and has omitted air, except for ventilation aspects of shelter and the occupational workroom atmosphere. Public health medical programs have a long history of concern with communicable and chronic diseases and occupational disease. Public health laboratory programs have developed to meet the challenge of these public health problems. From the growth of the urban complex has evolved an air pollution problem to challenge the medical, engineering, and scientific skills of public health teams.

The contribution of the public health laboratory to the solution of the air pollution problem is determined by a number of factors which also influence the effectiveness of the total public health effort to preserve a clean atmosphere, a natural resource of paramount importance. Foremost among these factors is the acceptance by the health agency of the public health challenge to preserve the clean air. Acceptance of this challenge comes through leadership of the public health groups which are concerned with the engineering, medical, and scientific aspects of community air pollution and is reflected in the delegation by the people of the responsibility for the protection of the air resource to their public health agency. The other factors evolve from acceptance of this responsibility.

The role of the public health laboratory in a health department program in air pollution may be illustrated by a history of the Air and Industrial Hygiene Laboratory of the State Department of Public Health of California.

The Public Charge

Control of air pollution in California is a responsibility which is delegated to local agencies, the air pollution control districts. The state legislature has given the Department of Public Health certain responsibilities including, but not limited to, studies of health effects of air pollution, determination of physiological effects of air pollution on plant and animal life, determination of factors responsible for air pollution, monitoring of air pollutants, development of administrative means of control of air pollution in emergencies, and assistance to local agencies.

Recent legislative enactments have directed the department to establish standards for pollutant levels in community air as well as standards for

emissions from motor vehicle exhaust.

Within the department the environmental aspects of the air pollution program are the responsibility of the staff of engineers and meteorologist of the Bureau of Air Sanitation. Medical aspects are the responsibility of the Bureau of Chronic Diseases, and the Air and Industrial Hygiene Laboratory has responsibility for the laboratory aspects of the program.

The Air Monitoring Program

The assessment of the state-wide problem of air pollution has involved the collection of data on pollutant levels on a continuous basis at many locations throughout the state. Local health departments and air pollution control districts cooperate with the department in the operation of a network for the daily manual sampling of total oxidant in the atmosphere and a network of stations for the continuous recording of such pollutants as total oxidant, nitrogen oxides, carbon monoxide, and sulfur dioxide. The value of data from these monitoring systems in the determination of the frequency and severity of air pollution, trends of pollution levels from season to season and year to year, and assessment of the need of control efforts is dependent upon uniform and reliable measurements.

A major effort of the laboratory has been the development and improvement of methods for pollutant measurement and of methods for uniform calibration of manual and automatic analysis at the widely dispersed sampling stations of the monitoring networks. Staff chemists perform the initial calibration of methods and instrumentation at stations in the manual sampling network for oxidant measurement and have instituted the use of a stable phenolphthalin reagent which is mailed to operators of the stations for recalibration and for checking of analytical results. To assure uniform operation of the network monitoring stations equipped with continuous automatic analyzers, the staff chemists perform chemical calibration of the analyzers at the field sites by technics developed in the laboratory for the production and analysis of dilute pollutant streams. The technical problem of uniform measurement of air pollutants at many widely separated and remote locations by personnel of several cooperating agencies is a huge one. The reliability of data collected from this largest system of air monitoring in the country is dependent upon well trained personnel, standard technics, and accurate calibration of instrumentation. Research in the development of simple and accurate calibration methods is necessary to assure valid data and meet the logistics of this large effort.

The air monitoring network includes particulate pollutant sampling by Hemeon spot samplers and high volume air samplers. The laboratory performs analysis of high volume filter samples of particulate air pollutants for selected metals such as lead, chromium, and zinc by emission spectrography, for nitrate and sulfate by wet chemistry, and for organic materials by gravimetry of benzene soluble materials. Much of the methodology has been developed in the laboratory and efforts are made to develop analytical methods for the assay of air-borne particulates for other constituents of biological importance, such as polycyclic hydrocarbons.

Important activity of the Bureau of Air Sanitation engineering staff is the study of special air pollution problems and intensive air pollution surveys. Laboratory staff participates in these field studies, assists in the sampling, performs analysis in the field, and develops methods of analysis to meet the needs of diverse local problems varying from investigation of point source emissions to intensive surveys of the total air pollution problem of a community.

Biological and Medical Program

The community air pollution in California which is of most concern is the smog produced from the reactions of pollutants under the influence of sunlight. It has its greatest impact on people and agriculture by causing eye irritation, decreased visibility, and annual losses of millions of dollars in damaged agricultural crops. At the present time smog is a problem in the densely populated areas of California which contain 80 per cent of the population. Workers at the University of California at Riverside have reported that in 1958 "oxidant" type crop damage was found in 13 counties of the state and that the annual economic loss to agricultural crops from air pollution is $8,000,000. The ultimate effectiveness of efforts to elucidate and control the photochemically produced smog of the state will be evaluated in terms of the resulting protection of the human population and agriculture from these deleterious effects of air pollution.

Studies to evaluate the biological and medical aspects of community air pollution are conducted by the Bureau of Chronic Diseases. These include: studies of experimental animals exposed to ambient air pollutants; correlation of general mortality and morbidity with air pollution data; study of special population groups, such as nursing home residents and asthmatics who are likely to be susceptible to air pollution effects; comparison of lung cancer incidence in population groups exposed to high levels of community air pollution with control groups; and studies of changes in lung function related to air pollution.

Much of the epidemiological field work in air pollution has been of the qualitative or subjective sort, such as studying the incidence of illness or proportion of persons with complaints of eye irritation. Laboratory research can add increased sensitivity and reliability to such studies by the development of suitable methods which can be readily applied to the large-scale field studies of human populations. Such research is just now getting underway in our department and has included studies on lung function and on levels of carbon monoxide hemoglobin. Immunochemical studies are now being planned.

One phase of the medical research program in air pollution is accomplished through contracts with medical investigators throughout the state. Medical research laboratories and the public health laboratory have certain problems in common involving generation of dilute concentrations of pollutants and aerosols, measurement of particle size, and chemical analysis of pollutants. Collaborative efforts and exchange of knowledge on the mutual problems contribute to progress of the research and to the departmental programs.

Leadership in research on the biological effects of air pollution on plant life is well established at the University of California at Riverside. Through the agricultural extension service, surveillance of air pollution injury to agricultural crops is carried on throughout the state. These data are made available to the department. Inclusion of biological indicators in air pollution surveys is seen as a desirable addition to which the laboratory can contribute.

The Standard-Setting Program

The task of the California State Department of Public Health in the establishment of standards for levels of community air pollutants, and motor vehicle exhaust emissions requires the application of the knowledge, skills, and judgment of the medical, engineering, and scientific communities. This effort will be a continuing one of revision and refinement as new knowledge of air pollution and its effect is discovered. Standards must be described in terms of the

methods by which pollutants are measured. One of the important contributions the laboratory staff will provide to this program will be the fundamental analytical methods by which pollutant levels will be described.

Laboratory Research and Development Program

Air sanitation is a relatively new concern of public health and the importance of photochemical smog has been recognized only recently. Because the study of smog has a comparatively short history, it is logical that a major part of the laboratory effort is directed to the problems of methodology of measurement and analysis of air pollutants. This continuing effort is of basic importance for the air monitoring program, for its expansion, and for inclusion of other important measurements in the program.

Enhancement of the value of the biological and epidemiological studies of the effects of air pollution are dependent in part upon the development of laboratory methods which will yield objective and verifiable parameters. In order to furnish these methods, laboratory investigations include methods for analysis of alveolar carbon monoxide, modified hemoglobin in animals exposed to gaseous pollutants, immunochemical changes in response to pollutant exposure, and physiological measurements of lung function.

Knowledge of particle size and composition of air pollutants is needed for the prediction of lung penetration and deposition of physiologically important pollutants. Research studies of this problem are included in the laboratory program together with the chemical, physical, and biochemical studies that will be required for the continuing revision and refinement of standards for air pollutants and automobile exhaust emissions.

Progress in the achievement of understanding of air pollution and its potential effects is vitally dependent upon elucidation of the nature of pollutants and of biological effects singly and in combinations. Many investigators throughout the country are engaged in research to answer questions on the chemistry and physics of air pollution, the toxicology of air pollution, the identification of phytotoxicants and eye irritants, and the multitudinous facets affecting human health. The important function of the laboratory is to keep abreast of these research developments, and to assist in relating research findings to the programs of the department.

Summary

The role of the public health laboratory in an air pollution program is dependent upon the program responsibility of the department of public health. In the dynamic field of air pollution, these responsibilities are continually changing to meet new needs and to apply the new research findings. In nearly four years of activity, the Air Industrial Hygiene Laboratory of the California State Department of Public Health has developed its contribution in the areas of laboratory support of programs of air pollution measurement, development of laboratory methods for analysis and epidemiological applications, research on the chemical and physical nature of air pollutants, and the relating of results of research on air pollution to the program of the department.

Dr. Helwig is chief, Air and Industrial Hygiene Laboratory, and Mr. Maga is chief, Bureau of Air Sanitation, California State Department of Public Health, Berkeley, Calif.

This paper was presented before the Laboratory Section of the American Public Health Association at the Eighty-Seventh Annual Meeting in Atlantic City, N. J., October 20, 1959.

Improvement of virologic methods over the last two decades has brought to light whole new areas for the investigation and control of communicable disease. The authors of this paper report on the implications of certain laboratory studies of enteroviruses, especially in epidemics.

THE LABORATORY IN THE STUDY OF ENTEROVIRUS EPIDEMICS

Richard T. Johnson, M.D., and Edward L. Buescher, M.D.

THE HISTORY of poliomyelitis provides a classic example of a changing epidemic pattern. A hundred years ago poliomyelitis was a rare sporadic malady; 50 years ago it was a recognized cause of epidemics in urban temperate zone populations, and in recent years it has been described the world around as potentially epidemic in both temperate and tropic zones and in both urban and rural populations. This change in pattern of overt poliomyelitis has been attributed to improving mass hygiene and living standards. However, clinical and epidemiologic investigations have provided little insight into the natural mechanisms responsible for the change in poliomyelitis ecology.

In the past 20 years, rapid improvement of virologic methods has provided new laboratory tools for investigation of poliomyelitis. The successful adaptation of certain prototype polioviruses to mice prompted the use of this host for primary isolation of virus, which in turn introduced the virologist to the Coxsackie viruses. More recently, the application of cell cultures to the study of poliomyelitis resulted in the identification of ECHO viruses. Thus, change in virologic methods has uncovered whole new groups of agents which share many physical and epidemiological properties with polioviruses.[1-3] These agents, the group A and B Coxsackie and ECHO viruses, have been grouped with polioviruses under the general term enteroviruses. Initially, these new agents were considered only fellow travelers with polioviruses, or as "normal" intestinal flora, but evidence soon accumulated associating these other enteroviruses with pleurodynia, herpangina, various exanthems, myocarditis, pericarditis, aseptic meningitis, and occasionally the syndrome of flaccid lower motor neuron paralysis.[4-6] Thus it is difficult to study poliomyelitis in the field without encountering these other enteroviruses, and questions concerning the ecology of polioviruses now automatically include these other agents as well.

Etiology of "Nonparalytic Polio"

It has been a common assumption that most nonparalytic central nervous system (CNS) disease which occurs in association with epidemic paralytic poliomyelitis is the result of poliovirus infection. Based upon this assumption it has been estimated that paralytic dis-

ease occurred in only one in ten patients with clinical evidence of CNS infection.[7] However, this ratio varies from one epidemic to another. For example, in Denmark, in 1934 an epidemic was described in which the ratio of paralytic to nonparalytic CNS disease was 1:25[8]; Paul, on the other hand, in a family study in New Haven in 1933 observed twice as many patients with paralysis as with nonparalytic CNS involvement, and this 2:1 ratio was confirmed among family contacts.[9]

Specific etiologic diagnoses were established by laboratory study during the 1955 poliomyelitis vaccine field trials and the ratio of paralytic to nonparalytic CNS infections with polioviruses was 4:1.[10] Between 1952 and 1958, 151 cases of sporadic poliovirus infection were studied in this laboratory and a similar ratio of 3:1 was found; further, of 430 cases of aseptic meningitis studied concurrently, only 8.8 per cent were due to poliovirus infections.[5] Thus, the majority of nonparalytic CNS infections, clinically indistinguishable from "nonparalytic poliomyelitis," are due to other viruses, and infection with these related agents might account for the variation in the observed ratio of paralytic to nonparalytic illnesses observed in poliovirus epidemics.

In a poliomyelitis outbreak in Sweden in 1952 this multiplicity of etiologies of the nonparalytic illnesses was indeed found to be true.[11] Johnsson reported that while type I poliovirus was responsible for the paralytic illnesses, only about 50 per cent of concurrent aseptic meningitis was due to polioviruses; group B Coxsackie, type 3, and other untyped enteric agents accounted for the remaining cases. Since that time many epidemics of aseptic meningitis due to Coxsackie and ECHO viruses have been reported, and in some situations multiple enteroviruses were associated with disease. For example, ten different enteroviruses were encountered during Sabin's study of the ECHO-9 epidemic in Milwaukee in 1957,[12] and seven were recovered during McLean's study of the B-5 Coxsackie epidemic in Toronto in 1958.[13] Although in these two situations multiple agents were producing disease concurrently, the epidemic could be attributed primarily to a single agent.

During the past two years we have been interested in enterovirus epidemics affecting military populations stationed in semitropical areas. These have not been planned field studies, but have developed from close collaboration between the clinician interested in infectious disease and our diagnostic laboratory. During this time two epidemics were observed where multiple enteroviruses contributed to a single outbreak.*

Bermuda Epidemic

Between June and September, 1957, both aseptic meningitis and pleurodynia were prevalent among United States Air Force personnel and their families stationed in Bermuda; several cases of paralytic disease occurred as well. A small sample of these patients was studied for specific etiology; the patients included three with paralytic disease, two with aseptic meningitis, and 12 with pleurodynia. A diagnosis of type I poliovirus infection was established for all three patients with paralytic disease (Table 1). However, type B-3 Coxsackie virus infection was shown to be related to both cases of aseptic meningitis and to nine of the 12 cases of pleurodynia. Type I ECHO virus infection was established in one of the remaining cases of pleurodynia. This 30-year-old female presented typical pleurodynia and no signs or symptoms of meningeal irritation; from stool collected on the second day of illness, type 1

* Laboratory methods and criteria for diagnosis employed in these studies are described in References 14 and 15.

Table 1—Bermuda Enterovirus Epidemic —June-September, 1957

Clinical Syndrome	No. of Patients Studied	Number of Specific Diagnoses Established
"Paralytic poliomyelitis"	3	3 poliomyelitis, Type I
Aseptic meningitis	2	2 group B Coxsackie, Type 3
Pleurodynia	12	9 group B Coxsackie, Type 3 1 ECHO, Type 1 2 undiagnosed
Pericarditis	1	1 undiagnosed

ECHO virus was recovered; attempts to recover a second agent from stool, by suppression of the ECHO virus with antiserum, were unsuccessful. Sera collected on the second day of illness and during convalescence demonstrated an increase in neutralizing antibody for ECHO 1 virus from $<1:10$ to 1:40, and no increase in antibody to any of the group B Coxsackie virus was demonstrated. Thus Coxsackie, ECHO, and polioviruses were each related to disease in the same population during the same time interval; although the syndromes were clinically distinct, involving both the CNS and respiratory systems, the association of group B Coxsackie viruses with aseptic meningitis and an ECHO virus with pleurodynia points out the importance of the laboratory in the study of the epidemic.

Hawaiian Epidemic

The second epidemic of enterovirus disease involving military populations in a semitropical climate occurred on the island of Oahu, Hawaii, during the spring and summer of 1958. This epidemic which is reported in detail elsewhere,[14-15] appeared to be typical poliomyelitis with approximately equal numbers of patients presenting paralytic and nonparalytic CNS disease. Seventy-seven patients with CNS disease admitted to Tripler Army Hospital were studied, 38 with paralytic illnesses and 39 with aseptic meningitis (Table 2). In 33 of the patients with paralytic disease, type I poliovirus was implicated by virologic studies; however two infants with lower motor neuron paralyses had group B Coxsackie, type 2, infections with no detectable antibody to type I poliovirus in convalescent serums; three patients remained undiagnosed. Of the 39 patients with nonparalytic illnesses type I poliovirus infections were established in only four patients; however, ECHO 9 infections were shown in 16, Coxsackie A-9 in seven, Coxsackie B-2 in two, and Coxsackie B-5, ECHO 15 and ECHO type "Crawford" in one each. Epidemiologic study carried out in retrospect showed that these varied agents were producing disease concurrently in the same geographic area; indeed, persons in neighboring houses and barracks often were found to be infected with different agents during the same week. Several additional patients were studied during this time, including a patient with fever of unknown etiology in which ECHO 9 virus was implicated and a patient with pericarditis associated with an ECHO 8 infection.[6] However, infection, clinically indistinguishable from paralytic and nonparalytic poliovirus infections, was most prominent. Hospitalization for aseptic meningitis due to Coxsackie and ECHO viruses increased over twofold from the rate for the same period of the previous year. Thus, concurrent increase in disease due to multiple enteroviruses appeared to be contributing to the epidemic, and yet these enteroviruses were producing clinically homogeneous disease.

Table 2—Hawaiian Enterovirus Epidemic—April-October, 1958

Clinical Syndrome	Number of Patients Studied	Number of Specific Diagnoses Established	Number of Patients
"Paralytic poliomyelitis"	38	Type 1 poliovirus	33
		Group B Coxsackie, Type 2	2
		Undiagnosed	3
Aseptic meningitis	39	Type 1 poliovirus	4
		Group A Coxsackie, Type 9	7
		Group B Coxsackie Type 2	2
		Group B Coxsackie, Type 5	1
		ECHO, Type 9	16
		ECHO, Type 15	1
		ECHO, Type "Crawford"	1
		Undiagnosed	7

Both of these outbreaks, then, were similar to the Swedish experience in 1952 in that multiple enteroviruses were being disseminated concurrently with poliomyelitis.[11] In each of these cases, the World Health Organization recommendation to abandon the clinical diagnosis of "nonparalytic poliomyelitis" deserves reemphasis.[10] Although only a small sampling was studied in Bermuda, it appeared that one virus, type B-3 Coxsackie, was the predominant cause of enterovirus disease. In Hawaii, however, unlike studies of temperate zone epidemics, no single agent was the predominant cause of illness. Hawaiian experience also differs from the others in its seasonal occurrence and its long duration, suggesting that climatic conditions may influence the dissemination of enteroviruses.

The biologic factors which influence concurrent spread of multiple enteroviruses were in no way clarified by these studies. Certainly host factors such as age and previous exposure to the viruses involved, and parasite factors such as variations in capacity for survival, or virulence, probably played some role in determining the etiologies and perhaps size of these outbreaks. The influence of simultaneous dissemination of different enterovirus in the same population upon clinical and epidemiologic characteristics of the epidemic has not been assessed. Dalldorf has presented sound experimental evidence for a sparing effect of Group B Coxsackie viruses and a synergistic action for Group A Coxsackie viruses upon induced poliomyelitis in experimental animals.[17-18] Critical study of future mixed enterovirus outbreaks should determine whether Dalldorf's concepts have an analogue in natural enterovirus infections and epidemics. Careful ecologic studies have been necessary to explain the natural history of other viruses which produce disease in man, such as the arthropod-borne viruses, but investigations designed to explain the relationships between man, disease, and those agents which appear to be obligate human parasites, are yet to be instituted. The key

to understanding the basic biologic mechanisms for dissemination of enteroviruses and their production of disease will be obtained with increasing knowledge of the complex relationship of man to his parasites, and of both to their common environment.

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This paper was presented before the Laboratory Section of the American Public Health Association at the Eighty-Seventh Annual Meeting in Atlantic City, N. J., October 20, 1959.

For many years the county has been considered the most appropriate administrative unit for dealing with health problems on the local level. Can we still accept this "fundamentalist" position, asks Dr. Crabtree? Is it the most strategic unit of local government for a period of expanding urbanization? This fresh look at a basic problem must be read before answering the questions.

A DECADE OF PUBLIC HEALTH IN PENNSYLVANIA: PRELUDE TO THE FUTURE

James A. Crabtree, M.D., F.A.P.H.A.

WHEN DR. WILBAR asked me to speak at this meeting, he suggested that I review the progress in public health made in Pennsylvania over the past decade. Perhaps he did so primarily because he assumed that, having lived in Pennsylvania for approximately the same ten years, I might have enjoyed the unique position of having seen the several developments at somewhat short-range during the period, but at the same time of being reasonably free of the prejudices inevitable in one who has deep roots in and long personal association with a program.

I came to Pennsylvania in May, 1949, to assist with the organization and development of the Graduate School of Public Health, University of Pittsburgh. At that time when my colleague, Dr. Ciocco, and I moved to Pittsburgh, the School of Public Health consisted of a dean (Dr. Parran), a secretary, and one office.

Quite understandably, our major preoccupation initially was with the problems of recruitment of faculty and staff and with hewing out an articulate educational philosophy from which the school's basic policies might emerge. Yet it was also clear from the very beginning that our school could never fully realize its hopes—and its potential—unless we had, in the state generally and in the more immediately surrounding communities specifically, well organized and properly administered health service programs.

Therefore, when I visited Harrisburg in the early summer of 1949, the visit was more than an ordinary courtesy call on the secretary of health. I wanted to get better acquainted with him and his staff and more especially to explore with them ways and means of cooperation and mutual assistance, including the possibilities of securing a number of full-time county health departments that would be accessible to our school.

About that time, the survey of the state health program made by the survey staff of the American Public Health Association recently had been completed, and the report issued under the imaginative title, "Keystones of Public Health for Pennsylvania." "Keystones" is an historical document in the annals of public health in this commonwealth. It made available to the citizen, for the first time in many years, a succinct descrip-

tion of the state health program, being as careful to applaud its strengths as to criticize its weaknesses; focusing with a high degree of discrimination upon a few basic concepts of state health policy.

In terms of the major weaknesses of the state health program ten years ago, the "Keystones" survey staff found a State Health Department comprised of approximately 5,000 persons, full and part time, in whose employment considerations of political preferment were all too frequently determining; indeed, where 90 per cent of all employees had been officially selected under the patronage system, and where it had become a tradition to have 90 per cent dismissals with every shift of party control over the state government. It is hardly surprising that under these conditions, the survey group found only one physician in Harrisburg and only three of the district medical directors who had had any formal public health training. They could find no local health officer, no dentist, no statistician, no health educator, rarely an engineer, and only a scattering of nurses with formal specialized training for their tasks.

They found a State Health Department that during the 42 years of its existence as such had witnessed a parade of 11 secretaries of health, ten of whom had moved into and out of the scene during the past 30 of the 42 years. For none of these ten could it be said that special professional qualifications for their task had been in evidence.

They found a state that ranked 31st in puerperal mortality, 27th in infant mortality, and that by common consent among thoughtful and interested physicians of the state ranked very low among the 48 states in general all-round performance and quality of its public health services.

They found a political framework not only for public health but for public services generally, so out of harmony with 20th century concepts and so involved and cumbersome administratively, that almost anyone, on a moment's reflection, need no longer wonder about the genesis of the classical term, "Philadelphia Lawyer." Within this framework they saw a mosaic of cities, first, second, and third class; boroughs; townships of first and second class; counties; and school districts of first, second, third, and even fourth class; all of these with responsibilities for such public health services as the citizen received, ranging from zero to complete as between the local and the state government.

They found nearly a thousand locally autonomous health jurisdictions; ranging in population from less than one hundred to two million; ranging in annual per capita expenditures from less than five cents to slightly more than a dollar (12 between 50 cents and a dollar, five more than a dollar, 425 less than a dime); and not a baker's dozen of them with full-time medically qualified health officers.

They found the State Health Department in its hedgehopping role (i.e., leapfrogging from one community, over an adjacent one, on to another), attempting to discharge its obligations through a combination of district health departments and county medical director systems, the latter consisting of a part-time physician plus a few sanitarians; the former consisting of a full-time physician (parenthetically, who did some private practice outside office hours); and a variety of professional and technical personnel such as nurses, engineers, dentists, and others who were reporting, however, administratively to their opposites in Harrisburg. They found a state in which the problems of mental health were apparently not recognized as health problems primarily, inasmuch as these came under the official jurisdiction of the Department of Welfare; where the health needs of the child of school age appeared officially to be con-

sidered more nearly within the competence of education than professional public health; and where health problems associated with employment in industry appeared to be of greater concern to nonhealth interests than to the health interests of the state government; and, indeed, those associated with mining somehow seemed so unique that they were under a still separate jurisdiction. They found an organization chart of the State Health Department which, if interpreted literally, would lead to the conclusion that Negro public health was of extraordinary concern in Pennsylvania, since there were two deputy secretaries of health devoted to that problem but only one deputy secretary who, by inference, was preoccupied mainly with non-Negro public health.

These are some of the features of Pennsylvania's state health program that the survey staff considered worthy of note ten years ago, and that in their view called for some kind of remedial action.

If we pause for only a moment to contrast then with now, all of us can be proud of the past decade of progress. Some of you can take much greater pride than I, because many of you have had a much more important role to play in securing that progress. All of you know in general terms, and most of you know quite specifically, the accomplishments of the past ten years. The content of the state health program has been enriched by the addition on an average of one new area of responsibility per year over the ten-year period. The department has assumed an alertness to its obligations by moving into the fields of air pollution, alcoholism, cleft palate, chronic disease, local health, veterinary public health, civil defense, and environmental safety.

You have witnessed the birth and growth of the annual health conference, this being, I believe, the eighth successive and increasingly successful one.

Professional training has become an element of state health policy to the point where you can now take some pride in the fact that nearly a third of the more than 200 upper professional staff hold advanced academic degrees in the several subspecialties of public health. You have seen a breakdown of the long-held but silly concept that the accident of geographic residence in some way determined one's professional or technical competence to serve the health interests of Pennsylvania's citizens.

You have seen the department reorganized administratively along lines more in keeping with modern concepts of public health practice.

If I had to point to the one single most basic change, I would describe it as a change in point of view; a change in climate, in outlook, in attitude; a change from apathy to one of enlightened interest and enthusiasm.

I said earlier that the great significance of "Keystones" was in the high degree of discrimination with which it focused upon a few basic concepts of policy; policy that first of all recognizes the professional nature of public health and that competence is required of those who administer it; policy that stresses training to the point where it must become traditional; policy on the issues of political jurisdiction, on the need for moving into new frontiers of opportunity, and for refinements of organizational structure. These concepts found expression in basic legislation, they sparked and heightened citizen interest, they gave new life to and expanded the community of interest of the voluntary health organizations, they widened the dimensions of opportunity of our educational institutions, and they captured the imagination of our political leadership.

Instead of belaboring further the contrasts and listing in detail the series of specific events that provide them, I should like to presume upon the title

assigned to me, and at this point address myself to the much more important question of where do wo go during the next ten years. Surely we can take great pride but only modest satisfaction in the progress thus far. I say modest satisfaction because we have hardly gotten off the ground in many important respects. Our successes, though real, are extremely modest and far from complete. What then is now indicated? What next do we need?

I submit that we need to take a fresh look at the county health department concept. This concept has been a part of the bible of public health for over 30 years. If you and I think it is sound, why does it seem to have so little sales appeal to the people? Legislation authorizing the establishment of county health departments in Pennsylvania was enacted in 1951 at which time the purposes and intent of this historic act became an item of state health policy. Since that time, four departments have been established under the provisions of the act; three by referendum, and one by direct action of the county commissioners. One way of looking at this situation would be to suggest that at this rate of progress, the goal set out for us by "Keystones" and adopted by us through our government will be realized finally in September of the year 2064!

Why is it that we have moved so slowly? Is it that the things we do routinely in public health are not very important? Is it that we are ignoring, intentionally or otherwise, the things that are most important? Or is it that the things we do are really basic and fundamental, but that their significance is beyond the understanding of the man on the street? In that case, how rational are we to continue to employ the referendum to carry out this major health policy? How can we reconcile a policy that merely permits proper and sensible local health jurisdictions with the concept that the protection of the health of the people is one of the paramount duties (not opportunities but duties) of the commonwealth, ranking in importance with the administration of justice? Stated in another way, if it is proper and appropriate for the several counties of the state to be mandated to carry out on behalf of the state such functions as public safety and justice, then what is unique to the protection of life that makes it a function less properly, or less appropriately, or indeed less urgently to be mandated by the state to the same several counties, particularly when the total weight of evidence finds the lesser jurisdictions incompetent to do the task?

Why do we emphasize this local health department issue? The answer is that, in my view, it is too basic to ignore. As the state moves into newer fields in one new category after another, admirable as this may be, let us guard against losing our perspective.

Perhaps at least every ten years, we might with profit remove from the shelf a few basic principles, dust them off, and then see if they still hold true. I shall list a few:

1. Is every citizen of the commonwealth entitled to public health services of the highest technical and professional quality that can be secured through reasonable expenditures of public funds?

2. Is it really the responsibility of the state to see to it that such services are provided throughout the state in the most effective and economical manner?

3. Is it not true that the nature, distribution, and relative importance of the health problems and needs of the people are not fixed or constant, but are in a continuum of change?

4. Is it not true also that our knowledge and understanding of the factors that contribute to health and disease similarly are not fixed or static but are constantly expanding, and indeed as of now are at a point where many hitherto irresistible deterrents to human health are within the competence of intelligently administered government to eliminate or to remove at least partially?

5. Can we not say also that public health within the social, political, and economic con-

text of 1958 is quite different from what it connoted two generations ago—indeed one short decade ago? Though its purposes remain the same, surely its strategy has become greatly transformed. In seeking to lift the burden of needless illness from the citizen, must it not resort primarily to services rendered for and with people and not law; to education and motivation and not to force? Must it not seek its most substantial dividends on the one hand from its educational efforts to make the individual citizen aware of how his health best can be secured, and on the other hand from its organizational efforts toward making actually available to him the facilities and services he needs, and not from the exercise of its police powers over him?

6. Do we not continue to hold the view that the great bulk of human health problems are primarily of local origin and therefore in all likelihood can best be met and solved through efforts organized on a local basis?

7. Take any one or all of the health problems that by common consent could be called important; take the very impressive list against which new programs have been inaugurated in Pennsylvania since 1948. For all of these one can find a block in the organization chart of some state agency in Harrisburg (not always the State Health Department). But must we not say, in all candor, that in too many instances by the time the program has fanned out in the direction of the grass roots, service to the citizen has become diluted to a tragic degree?

If we agree on these premises, then we have good reasons for continuing to emphasize the local health department issue. But just because the pioneers over two generations (Welch, Lumsden, Rankin, Freeman, Bishop) exploited the concept of the county as the most sensible and strategic unit of local government to serve as the instrument for public health services, are we wise now in following it exclusively, all the while ignoring the whole chain of explosive events that is catapulting "metropolis" into such prominence?

The urbanization of our population, in time, may well alter the county health unit concept for many parts of Pennsylvania. There is impressive evidence that many of the problems ahead of us will have to be dealt with on a metropolitan area basis. This conceivably could mean a surrender by some of our traditional jurisdictions back to the state of their local responsibility, so that the state in turn could reassign it to the metropolitan area. Admittedly this must take time because it cannot reasonably be expected to take place until metropolis itself has achieved some cohesion and some sense of community.

The difficulties facing the metropolitan area with respect to public services generally appear at first glance to be almost insuperable; with its patchwork of the new and the old; of distribution of age, race, and income; of private and public ownership; of households, firms, and institutions whose interests converge, diverge, conflict with, and complement each other; of municipal agencies competing for tax revenues; and of political parties competing for votes each with only partial success.

It is within this framework that we shall encounter in the years ahead many public health problems that are unique to the experience of many of us. They are unique in the degree to which they are culturally based; and they will call for skills not now possessed by the vast majority within our ranks.

However, with all the complexities and ambiguities of metropolis, I think we are beginning to see some break-throughs for optimism. There is evidence that the metropolitan area is beginning to acquire some sense of community, a realization that the destiny of any one of its parts is that of the whole. There is improvement in communication among those who make key decisions (businesses, corporations, the professions, government officials). This does not always bridge the distances between special interests, but certainly the gaps are being narrowed and agreements reached on common goals. There is evidence that increasing reliance is being placed upon knowledge as the basis for public and private decisions on metropolitan-wide

community affairs. And finally there is a new and wholesome regard for planning. The term has taken on a respectability that it never before enjoyed. It is the rare municipality today that does not have a planning agency. City planning has become accepted as an essential function of city government. Indeed one not infrequently finds planning agencies today being criticized for taking too narrow a view of the areas of concern.

In these concluding comments, I have dwelt upon metropolis not to suggest that Pennsylvania will, during the next decade, be transformed into a solid chain of metropolitan areas or that all or even most public health problems will be removed from the competence of many if not most of our counties, but rather to suggest the contrary; and, in addition, that today's problems of metropolis with all their subtleties are most likely to provide the prototype of those of the future for the state as a whole. In these terms, the past decade of progress in Pennsylvania can be viewed only as a prelude to a task far more challenging, indeed far more exacting of those of us who serve the cause of public health during the years ahead.

Dr. Crabtree is dean, Graduate School of Public Health, University of Pittsburgh, Pittsburgh, Pa.

This address was presented before the Eighth Annual Pennsylvania Health Conference, University Park, Pa., August 18, 1958.

13th International Congress on Occupational Health

An International Congress on Occupational Health is held in a different country every three years under the auspices of the Permanent Committee and International Association on Occupational Health. Number XIII will be held in New York City, at the Waldorf-Astoria Hotel, July 25-29, 1960. During the past 12 years Congresses have been held in Helsinki, Lisbon, and London.

Among the sessions scheduled are those on medical, surgical and administrative practices, environmental hygiene, work physiology and psychology, education and training, problems in specific industries, and social and legal aspects of occupational health.

Tours will be conducted to toxicology research laboratories, industrial plants of various kinds, governmental health and industrial hygiene institutions, and educational centers for industrial health.

For room reservations, R. E. Eckhardt, M.D., Secretary-General, IAOH, P. O. Box 45, Linden, N. J.

This is a forthright discussion of an important community problem. The author analyzes clearly why she considers illegal abortion a problem for public health workers and states what can be done about it.

ILLEGAL ABORTION AS A PUBLIC HEALTH PROBLEM

Mary Steichen Calderone, M.D., M.S.P.H., F.A.P.H.A.

BEFORE I DISCUSS illegal abortion as a disease of society, let us look at the definition of the word "disease." In the 22nd edition of the "American Illustrated Medical Dictionary," disease is defined as "any departure from the state of health, an illness or a sickness; most specifically, a definite morbid process having a characteristic train of symptoms. It may affect the whole body or any of its parts, and its etiology, pathology and prognosis may be known or unknown." As a public health person, I would add a public health concept, epidemiology, to etiology, pathology, and prognosis.

This definition is applicable equally to the individual or to the group. Thus in calling illegal abortion a disease of society, I point to the very existence of illegal abortion as a departure from a state of total health of that society. It is a morbid process in the social structure, having a characteristic train of symptoms. It does indeed affect the whole body of society or any of its parts, namely, individuals. As its etiology, pathology, and epidemiology are only partially known, its prognosis, prevention, and treatment can for the most part, therefore, only be guessed at.

Go back even further in the definition of "disease" to the roots of the word in the French language: The negative "des" and the word "aise," ease mean literally un-ease; and this is truly an uneasy condition existing in our society; so uneasy that it makes us uneasy even to contemplate it. Therefore, we have in the main preferred not to contemplate it.

However, in 1955 it was exhaustively contemplated by 43 men and women from the various disciplines of obstetrics, psychiatry, public health, sociology, forensic medicine, and law and demography, who were uneasy enough about this dis-ease to sit down for eight, three-hour sessions in an effort to bring it into realistic focus. The proceedings and conclusions of this conference were published in book form in 1958. Here are some of the facts established.[1]

Fact No. 1—In 46 states legal abortion is permitted to preserve the life of the mother; three states allow, in addition, preservation of the health of the mother. Thus in the other states* such abortions as are being performed legally, that is, therapeutic abortions, are for the most part being done on the word of psychiatrists that the unwilling mother will otherwise commit suicide. This procedure has developed because medically speaking, that is, from the point of view of diseases of the various systems, cardiac, genitourinary, and so on, it is hardly ever necessary today to consider the life of a mother as threat-

* Alaska and Hawaii were not then states.

ened by a pregnancy.[2] However, and this is a big however, interpretation of the law varies from city to city within a state.

Fact No. 2—Interpretation of the law also varies between hospitals within a city and between services in the same hospital, because the legal therapeutic abortion rate is higher on private services than on ward services. A public health official put this pointed question at the conference: "Why is there such a difference in the incidence of therapeutic abortion by hospitals? Is the woman in a public hospital healthier than a woman on a private service in a voluntary hospital or in one voluntary hospital as against another one?" The second fact to be established, therefore, is that the border zone between legal and illegal abortion is narrow and shifts frequently, depending on personnel and locale. Indeed, as one participant bluntly put it: "I would like to call attention to the artifact of distinction between illegal and therapeutic abortion. Actually, according to my definition, in many circumstances the difference between the one and the other is $300 and knowing the right person." So much for fact number two.

From the first two facts it becomes clear that the interpretation of legality is probably in the eye of the beholder. What we have to admit is, as was repeatedly emphasized, that most therapeutic abortions are in the strictest sense of the law actually illegal.

Fact No. 3—Abortion is no longer a dangerous procedure. This applies not just to therapeutic abortions as performed in hospitals but also to so-called illegal abortions as done by physicians. In 1957 there were only 260 deaths in the whole country attributed to abortions of any kind. In New York City in 1921 there were 144 abortion deaths, in 1951 there were only 15; and, while the abortion death rate was going down so strikingly in that 30-year period, we know what happened to the population and the birth rate. Two corollary factors must be mentioned here: first, chemotherapy and antibiotics have come in, benefiting all surgical procedures as well as abortion. Second, and even more important, the conference estimated that 90 per cent of all illegal abortions are presently being done by physicians. Call them what you will, abortionists or anything else, they are still physicians, trained as such; and many of them are in good standing in their communities. They must do a pretty good job if the death rate is as low as it is. Whatever trouble arises usually comes after self-induced abortions, which comprise approximately 8 per cent, or with the very small percentage that go to some kind of nonmedical abortionist. Another corollary fact: physicians of impeccable standing are referring their patients for these illegal abortions to the colleagues whom they know are willing to perform them, or they are sending their patients to certain sources outside of this country where abortion is performed under excellent medical conditions. The acceptance of these facts was such that one outstanding gynecologist at the conference declared: "From the ethical standpoint, I see no difference between recommending an abortion and performing it. The moral responsibility is equal." So remember fact number three; abortion, whether therapeutic or illegal, is in the main no longer dangerous, because it is being done well by physicians.

Fact No. 4—Other countries are having significant experiences with illegal abortion. Take France first, a Catholic country, where no abortions and no contraceptive measures are legal. It is a country, however, whose citizens acting independently have lowered the birth rate by three methods. Two are contraceptive, namely, the use of the condom and withdrawal; the third is abortion. I have no figures on the mortality rate from abortions in France, but various

opinions estimate that the ratio of illegal abortions to live births is approximately 1 to 1. Incidentally, France has a law that requires the reporting of all pregnancies to the police!

Next is Japan, a country whose overpopulation and use of land to the saturation point helped to spark the Second World War. Japan has attacked its high birth rate through a very strong governmental contraceptive program, with contraception available at 900 governmental health centers (the government's budget for family planning in 1958 was $600,000) and also by the legalization of abortion, which can be performed by most physicians at the nominal cost of two or three dollars. It has been estimated that the over-all abortion ratio there is the same as that in France, namely, one abortion for every live birth. In any event, Japan has succeeded in lowering its birth rate by 50 per cent. A young Japanese newspaperman tells me that last year, for the first time in years, there actually were empty seats in the lower grades of schoolrooms in Japan.

Next is Scandinavia: Its three countries have a more or less similar policy on abortion, with boards, carefully set up under governmental auspices, which consider all applications for abortion from the medical, psychiatric, and sociological points of view. In these countries abortion is allowed not only to preserve the life of the mother, but to preserve her health. The legal interpretation of preservation of health is broad, including as its does mental and emotional health and taking into account as it does socioeconomic pressures; eugenic factors, such as hereditary disease; and humanitarian pressures and emotional trauma due to pregnancies resulting from rape, incest, or extreme youth of the mother. Interestingly enough, even with these provisions and with contraception broadly available, Norway, Denmark, and Sweden still admit to some illegal abortions. So fact number four points up that women who are unwillingly pregnant will obtain an abortion, whether legally or illegally as in Scandinavia, or illegally as in a completely closed system, such as in France.

Fact No. 5—Brings us home to the United States, where it is clear that women, unwillingly pregnant women, are also obtaining abortions. These women are as often married as unmarried, more often white than colored, more often of college level education than of high school education.[3] They are also from all religious groups. Here, as elsewhere, the difficulty lies in determining the incidence, because the groups for which we have available statistical data are very restricted. The best statistical experts we could find would only go so far as to estimate that, on the basis of present studies, the frequency of illegally induced abortion in the United States might be as low as 200,000 and as high as 1,200,000 per year. During the course of the conference, however, it was notable that the figure of 1,000,000 abortions yearly, or one to every four births in the United States, was advanced again and again by the various participants. Fact number five, therefore, is that whether the incidence is as low as 200,000 or as high as 1,200,000, nevertheless, we do have an illegal abortion problem.

Should public health people look upon it as a problem? Can they shrug off even 200,000 invasions of pregnant uteri as of no medico-social importance? But, one can say, only 260 deaths from all types of abortions—that is a low mortality rate. Why should illegal abortion be a public health problem?

The answer is that we have passed the stage where public health concerns itself only with death rates. The World Health Organization's definition of health is that it is "a state of complete physical, mental and social well-being and not merely the absence of disease." Remember the

French roots of the word dis-ease and the definition, "any departure from a state of health that can affect the whole body or any of its parts." As public health people, we are interested in the whole body, that is, in society. We are also interested in the whole body of the individual who is a part of society. Here are some of the symptoms of this disease of society, illegal abortion.

First, medical indecision regarding the interpretation of the law: We do not have that kind of indecision concerning permissible bacteria counts above which milk or drinking water are not considered safe. One can interpret the law in only one way as far as most public health measures are concerned, but the interpretation of the law regarding abortion depends upon who is interpreting it and how far he is willing to go. Indeed, the conference participants recognized that "present laws and mores have not served to control the practice of illegal abortion" and they felt that "to keep on the books unchallenged, laws that do not receive public sanction and observance is of questionable service to our society."[4]

A second symptom, inequity of application of a medical procedure: Remember the woman with $300 who knows the right person and is successful in getting herself legally aborted on the private service of a voluntary hospital, in contrast to her poorer, less influential sister on the ward service of the same hospital or in a public hospital in the same city, a woman in exactly the same physical and mental state as the first one—whose application is turned down?

A third symptom, inconsistency of application: Even with $300 a woman applying at one hospital may be turned down and go to another hospital in the same city where, with the right combination of medical opinions, she may obtain a legal abortion. Is this sound medicine, soundly practiced?

Another symptom, and probably the worst of all, the quasi-legal subterfuges and hypocrisies that must be undertaken by an honest and concerned medical man when he wants to provide his patient with a procedure that in his best medical judgment is indicated.[5]

And last but not least, as a symptom of a disease of our whole social body, the frightening hush-hush, the cold shoulders, the closed doors, the social ostracism and punitive attitude toward those who are greatly in need of concrete help and sympathetic understanding, the unwillingly pregnant women of all ages, both married and unmarried. A former abortionist who testified at the conference stated that in his experience "the difficulty lies with the fact that the average unwillingly pregnant woman does not know what to do or where to turn. There is no place available where she can air her situation comfortably and quietly and confidentially. Her only resource at present is to go to a local physician and under present standards he is afraid even to look at her. He has no place to send her. He has no recommendations to make to her. So consequently she goes to an abortionist." Conference members agreed, and this was backed up by evidence from the Scandinavians, that when a woman seeking an abortion is given the chance of talking over her problem with a properly trained and oriented person, she will in the process very often resolve many of her qualms and will spontaneously decide to see the pregnancy through, particularly if she is assured that supportive help will continue to be available to her.

I ask you not to assume that I am indiscriminately for abortion. Believe me, I am not. Aside from the fact that abortion is the taking of a life, I am also mindful of what was brought out by our psychiatrists — that in almost every case, abortion, whether legal or illegal, is a traumatic experience that may have severe consequences later on.

So I am not for abortion but, trained in public health, I am for preventing any need for abortion, and I also am for facing the problem of illegal abortion which is with us. It is a problem not of the unmarried girl alone, but also of the married woman. It is a problem far broader in scope than just the question of a woman who does not want a particular pregnancy. Indeed, it was recognized by conference participants that "although the effort to obtain an induced abortion may indicate that the woman is physically ill, more often it reflects one or more of a complexity of factors, such as poor social or economic environment, disturbed marital relations, psychiatric or neurotic disturbances in the family or quite simply a need to keep her family at its present size." There was general agreement with the words of one psychiatrist: "When a . . . responsible female seeks an abortion, unless the warrant for it is overwhelming—as say in the case of rape or incest—we are in effect confronted both with a sick person and a sick situation." Can we, as public health people, deny that we have a stake in dealing with either one of these? We should move into this area of concern in several ways.

First, in the prevention of the need for abortions we can do one obvious thing, make sure that means of regulating parenthood are available to every woman in every maternal health service. This will mean the biological method of controlling conception for those whose religion accepts only this method; and all of the accepted medical methods for those whose religious beliefs not only accept family planning, but look upon it as a part of religious obligation. In the May 9, 1959, edition of the Corpus Christi, Tex., "Caller," there was a report of eight women in one day hospitalized "following clumsy, unsanitary abortions." There were no leads as to the identity of the abortionist, if there was one—for these, as indicated at the conference, may well have been self-induced. But the news report went on to say that the City-County Health Unit director publicly advised persons not wanting more children to consult the Planned Parenthood Center. Making contraceptive advice freely available to all who desire it was one of the recommendations of the conference. The Model Penal Code of the American Law Institute states in its May, 1959, draft that "the restrictions which society places on the distribution of contraceptive . . . information are themselves contributors to the abortion problem."[4]

Another recommendation of the conference: "Encouragement, through early, continued and realistic sex education, of higher standards of sexual conduct and of a greater sense of responsibility toward pregnancy." Surely those of us who in dismay have contemplated the 200,000 out-of-wedlock births yearly, with an increasing number to teenage girls, know how important this recommendation is. Every health officer sincerely concerned with the mental and social health of the people in his jurisdiction should be spearheading efforts in sex education for all age groups and should be joining forces with religious and mental health programs in this area. Sex education and provision of conception control in all maternal health services are two areas where public health must act.

A third area, however, could be of real significance. Remembering that a disease that is concealed can never be cured, I would like to enlist public health in an effort to establish better figures on the incidence of illegal abortion. Actually, of course, we know that the nature of this problem is such that one will never get accurate ex post facto figures. We will never find out how many illegal abortions have been performed, but how about trying to find out how many are being asked for? Suppose requests for

abortion were made reportable? Why not? Suppose that every time a woman comes to a doctor asking for an abortion, he makes a note of it along with some easily obtained information and sends this note to his health officer. Suppose that after a few such efforts, physicians discovered that the sky did not fall in on them in the person of the law and that the privacy of their patients was being respected. At the end of two or three years we might really know something about this disease of society. Let us say that in a certain county this study was undertaken cooperatively by the health department and the county medical society. The probability is strong that almost every illegal abortion is preceded by a visit of the woman to some doctor with a request for a legal abortion, a request which, of course, is almost always turned down. But every doctor visited by such a patient should forward to his health officer a report form containing the following information: No name, no identifying material, but age of woman, her marital status, her race, the number of pregnancies and the number and ages of her living children, some estimate of her socioeconomic status, her stated reasons for asking for the abortion, the doctor's reasons for refusing the abortion or, occasionally, his reasons for granting it. And finally, one most valuable bit of information which in time the doctor would feel quite free to answer: "If the law of this state left you completely free to exercise your medical judgment, would your opinion be that this woman's pregnancy should be terminated?"

Public health has always risen to the challenge of the unknown, the difficult, the seemingly unconquerable. Furthermore, public health has continually enlarged the boundaries of its sphere of action, from dealing with such concrete and related entities as typhoid fever, water and sewage, or diphtheria, scarlet fever, milk control, and immunization; to dealing with such problems as tuberculosis, with its socioeconomic as well as physical components, venereal disease, with its ethical and moral as well as sociological and physical components, and mental health problems, whose components touch every aspect of life and society. We should not now hesitate to acknowledge our responsibility even in an area so loaded with emotion and moralistic overtones as illegal abortion and sex education. Here at least we should be brave enough and responsible enough to provide whatever preventive measures are immediately available, while at the same time we should be curious enough to do such fact-finding as might give us a basis for possible additional means of control.

More and more public health needs to enlist workers possessing three qualities: honesty, courage, and energy. Honesty means that you face the facts as they really are and not as you hope they are. This is what case finding would help us do. Courage means that you are not afraid of yourself nor of the facts that you face, and that you are not afraid to proceed along the lines of your convictions nor afraid of the criticism and opposition they may incur. Courage is what we need if we are to make progress in this emotion-beclouded field. Energy means that till the day you die you work morning, noon and night to carry out what your honesty and courage have told you must be done. This is the energy that public health workers have always had available in forming the effective arm of medicine for the individual and for society. I would wish this energy, this honesty, this courage to be applied to the control of illegal abortion as a disease of society, a dis-ease in which the mental and physical agony of perhaps a million women every year present themselves as strong candidates for the public health worker's professional and humanitarian concern.

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Prosthetist—Orthotist Training Offered

The Institute for the Crippled and Disabled in New York City is now accepting applications for its training courses for orthotic and prosthetic technicians which will begin on September 12, 1960, and end June 30, 1961.

Academic instruction by professional staff of the institute and of New York University with which it is affiliated will be supplemented by shopwork training in the institute's brace and limb manufacturing plant under the direction of certified prosthetists and orthotists. Clinical experience will be provided through field assignments at hospitals and other institutions working with the disabled. The present course is the only one of its kind available to persons without prior experience, offering both theoretical and supervised on-the-job experience.

Persons applying before August 1 will have preference. Further information from Director, Prosthetic and Orthotic Laboratories, Institute for the Crippled and Disabled, 400 First Ave., New York 10, N. Y.

In 1958 the Journal published a study by Drs. Knobloch and Pasamanick linking seasonal variations to the occurrence of mental retardation. The author of this paper has undertaken a critical analysis of that report. His findings are presented here.

SEASONAL VARIATIONS IN THE BIRTH OF THE MENTALLY DEFICIENT?

Theodor D. Sterling, Ph.D.

THE EFFECT of season on health has always been a tempting source for speculation. One recent attempt to link seasonal variations to mental retardation has attracted considerable attention and interest. This is an investigation by Drs. Hilda Knobloch and Benjamin Pasamanick described in an article entitled "Seasonal Variations in the Birth of Mentally Deficient."[97, p. 1207] Their findings have been summarized as follows:

"In studying the admissions of mentally defective children, born in the years 1913-1948, to the Columbus State School, it was found that significantly more had been born in the winter months, January, February, and March. Since the third month after conception is known to be the period during pregnancy when the cerebral cortex of the unborn child is becoming organized, any damage which occurred at that time could affect intellectual functioning. The months when this might happen would be June, July, and August, the hottest summer months, when pregnant women might decrease their food intake, particularly protein, to dangerously low levels and consequently damage their developing babies. If this were so, one would expect that hot summers would result in significantly more mental defectives born than following cooler summers. This was exactly what was found to a highly significant degree."

In order to make this comparison, the investigators compiled all birthdays by months for the 34 years of the survey for children admitted to the Columbus State School. The number of children born in any particular month were divided by the total births for the state as a whole. The resulting ratios are labeled "incidence" rates. Their distribution by months are given in Table 1.

Table 1—Mental Deficiency First Admission Rates by Month of Birth, Columbus State School, 1913–1948 (Excluding 1946)*

Months	Number of Births	Number of Admissions	Rate/ 1,000
January	358,848	503	1.402
February	339,704	512	1.507
March	365,631	520	1.422
April	342,624	475	1.386
May	350,131	485	1.385
June	349,894	472	1.349
July	373,853	494	1.321
August	377,085	489	1.297
September	361,995	484	1.337
October	354,558	463	1.306
November	334,113	473	1.416
December	342,881	485	1.414
Total	4,251,317	5,855	1.377

* Reproduced from Knobloch, H., and Pasamanick, B. Seasonal Variations in the Birth of the Mentally Deficient. A.J.P.H. 48:1201–1208, 1958.

Quite properly the monthly variations were submitted to statistical analysis—which appears to have been done as follows.* The differences between the months of February and August and between the first three months and the summer months were tested by use of the Critical Ratio. The value of the Critical Ratio for the difference between the highest and the lowest months was 2.34, and for the first three months of the year and the summer months, 2.43. This indicates a corresponding probability (for finding differences as large as ones observed by chance alone) of 2/100 or less. Consequently, it was concluded that the differences did not reflect chance variations and to search for relationship between season and the likelihood of mental retardation.

On closer examination this conclusion does not appear to be entirely warranted. First, the appropriate statistical test was not used and it is still possible that the monthly fluctuations are purely random. Second, the method of testing involved two separate hypotheses. Finally, the sampling procedure may well have introduced a bias.

Besides purely statistical considerations, additional questions can be raised about procedural methods and generated test hypothesis. With admirable honesty, the motivation leading to the study is set forth, namely that infants conceived in the colder months would have an increased incidence of mental deficiency when compared to infants conceived in the summer, because of the increased prevalence of viral infections during the winter. When the observations failed to support this hypothesis and the variations between highest and lowest birth months appeared to be significantly different, an alternative line of reasoning was substituted and new hypothesis tested against the data. Such a step may only be taken with extreme caution since the relationships so uncovered may well be spurious. Before accepting any such conclusions it is usually considered mandatory to check with other data. This precaution was not observed. When the distribution of birth months for local institutions was compared with the rates presented by Knobloch and Pasamanick, the results indicated that the data presented by them was influenced by sampling error.

* The writer was not able to obtain information on details of the statistical analysis used by the authors. The review on the precise statistical procedure of this and later analyses is based, in part, on conjecture. However, the technics used are sufficiently routine to make relevant criticism possible.

Testing an Hypothesis on Fragments of Data

The logic in employing the so-called Critical Ratio is to test the hypothesis that two sample means differ by chance only. Those in question are the incidence rate of feeble-minded registration in February and in August, each based on 34 observation years. Originally 12 samples of 34 months each were drawn. Ignoring for the moment all other considerations, especially why these particular two months were selected, one must ask what invariant effect such a selection will have on the outcome of the test. Was a bias introduced in the statistical test by picking and choosing the data for analyses?

The procedure can be simulated by drawing 12 samples of 34 each from a single population. Each sample should represent an estimate of the mean value of that population. Another and simpler way is to enter a table of random numbers, selecting 12 successive columns and taking the first 34 digits. Table 2 gives the mean values of the first 34 digits of the first 12 columns of the table of random numbers found in Dixon and Massey.[2]

While each of the means in Table 2 is an estimate of the true mean, the fluctuation of the 12 samples demonstrates the

expected variation. The highest and lowest value (i.e., sample 9 vs. sample 12) were now subjected to the test that they are two random samples selected from the same population and differing by chance alone. Computing the Critical Ratio, a value of 3.33 was obtained which would lead to the rejection of the hypothesis that they are samples from the same table or have even been obtained from a random table for that matter. The explanation for this outcome is simple. Having selected 12 samples, it can be expected that the means of these samples will show a definite distribution about the true value of the population mean. This is given by the standard error of the mean. Where S is the true standard deviation of digits in the table of random numbers, the standard error of sample means, Sm_i each based on 34 digits, is given by

$$Sm_i = \frac{S^*}{\sqrt{34}}$$

Further, something is known about the distribution of these sample means. Since each mean is computed from 34 observations, the distribution of means will be approximately normal and the characteristic will be given exactly by the *t* distribution for 33 degrees of freedom.† This means, for instance, that 80 per cent of the sample means may be expected to lie within +1.32 or −1.32 standard errors of the true mean, or, conversely, that 20 per cent of the observed mean values will lie more than 1.32 standard errors above and below the true mean. The expectations are pictured in Figure 1.

In taking 12 samples it can be expected that the mean of one will lie at least 1.32 standard errors below the true mean and that one will fall the same distance above. The likelihood is very good that the distance between the highest and the lowest mean is at least 2.64 standard deviations. However, the Critical Ratio is no more than a measure of the number of standard errors between two sample means. The value of 3.33 for the Critical Ratio in the theoretical experiment does not mean that the table numbers given by Dixon and Massey are not truly random. The value was obtained by comparing the highest and lowest sample mean in the distribution of samples and ignoring the remainder of the data. Had all the data been used, the sample means would have been distributed in an approximately normal manner about the true mean of 4.5 and about a true mean difference of Zero.

Ignoring for the moment the existence of a plausible hypothesis about the particular two months tested by Knobloch and Pasamanick, it can be concluded that their values for the Critical Ratio fall well within the expectation of (a) sampling from a common population of means, and (b) testing the hypothesis that the highest observation differs significantly from the lowest observation.

* The computational procedures and mathematical proofs have been eliminated as unessential to major criticisms raised here. Any introductory text in elementary statistics will give the necessary proofs.

† Since the number of observations were relatively few, the author should have used tables of the *t* distributions rather than the normal curve as they appeared to have done. However, the error involved would be trivial.

Table 2—Means of the First 12 Columns, Digits 1 to 34, in the Table of Random Numbers, Dixon and Massey (page 336)[2]

	Columns											
	1	2	3	4	5	6	7	8	9	10	11	12
Means:	4.82	4.20	4.35	4.88	4.38	4.14	4.94	5.32	3.41	4.64	3.97	5.41

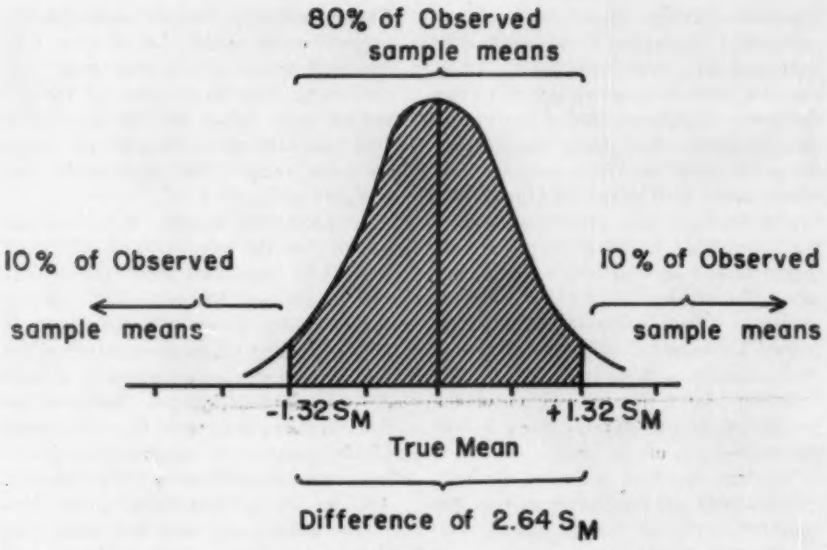

Figure 1

Similar considerations apply to the utilization of this test (i.e., the Critical Ratio) for the months of January, February, and March vs. July, August, and September, but the interpretation is somewhat more complex. This Critical Ratio is a test between no more than two means. It applies when the hypothesis is tested that an observed mean differs from some expected value or that the difference of two observed means differs from the expected value of K (where K=0 probably more often than to any other value). Hence the Critical Ratio should not be used to compare two groups of three means each.

There are ways in which the Critical Ratio could have been employed in this investigation. One would be to average for each of the 34 years the number of deficient children for the selected birth months and test the hypothesis that the two distributions of averaged values came from a common population. In the second instance, the three months in the selected periods for the 34 years could be treated as separate observations and the two distributions compared in a similar fashion. In either case the mean difference and the standard error of the mean difference would have been almost identical.* Since February yielded the highest and August the lowest mean value, the expectations are that two months plus February would give a mean that was larger than that of two months plus August. The difference between pooled means also may be affected by the dependence among adjacent months. In addition, the estimate of the standard error of the mean is now based on a total of 102 months for each group of observations and hence significantly smaller than the previous

* The writer was not able to obtain information on details of the statistical analysis used by the authors. The review on the precise statistical procedure of this and later analyses is based, in part, on conjecture. However, the technics used are sufficiently routine to make relevant criticism possible.

standard error based on only 34 observations.

Turning again to the simulated observations and assuming that the significant difference found between samples 9 and 12 (i.e., September and December) indicates differences in random numbers chosen in the fall and winter, this hypothesis was tested by pooling samples 9, 10, and 11 on one hand and 12, 1, and 2 on the other. A mean difference of 0.81 and a Critical Ratio of 2.00 is obtained which is quite clearly of statistical significance ($P \leq 0.02$). Such a high value of the Critical Ratio again would lead wrongfully to rejection of the hypothesis that samples 9, 10, and 11 and samples 12, 1, and 2 come from a common population of numbers.

The sequence in which this argument is developed has postponed to this point the question of why February and August were chosen for testing (or why the 9th and the 12th sample of the means of random numbers were utilized) and the effect that this selection may have had on the outcome of the statistical test. Lest objection be introduced that a plausible hypothesis compelled a specific test, it should be pointed out that the months chosen for analysis by Knobloch and Pasamanick were no more determined by previous arguments than was the choice of samples 9 and 12. In fact, it was predicted that "infants conceived in the winter months . . . would have an increased incidence of mental deficiency when compared to infants conceived in the summer months, because of the increase in prevalence of viral infection during the cold season."[7, p. 1281] The expectation to be tested or the hypothesis to be either rejected or accepted was that the incidence of retarded children would be largest in the fall (or summer) and smallest in the spring (or winter). The analysis actually performed by the investigators was therefore on a brand new hypothesis which in turn stemmed from the inspection of experimental results. Such a procedure is completely congruent to the choice of which of the random samples to compare (as long as they were the highest and lowest values obtained).

Confounding Hypothesis

The incidence of feeble-minded births was adjusted by dividing the number of retarded birth registrations in the Columbus State School by the number of total births in the state of Ohio.

$$\text{Incidence} = \frac{\text{number of births registered as retarded by month}}{\text{number of births in state during same month}}$$

The incidence may be higher or lower for each month depending not only on the rate of retarded births but also on the rate of normal births. It is quite conceivable that the number of retarded remains equal from month to month or year to year and that all variations in incidence are due to fluctuation of the total birth rate. The incidence can vary because of:

a. The total number of births for the state remains stable but the number of retarded births changes.
b. The number of retarded births remains stable but the number of total births changes.
c. The number of both retarded and total births changes.

Accordingly, seeking to establish that the incidence of retarded children is affected by seasonal variation it is not sufficient to test the hypothesis with this kind of adjustment. Assuming that such variation proves to be significant it may still be due to the seasonal variation of all births rather than to the seasonal variation of retarded births. Two separate tests are required.

1. A test of (or of lack of) relationship between normal birth rate and retarded birth rate.
2. A test of difference between monthly rates of seasonal variation.

Both variates could have been tested simultaneously by use of an Analysis of Covariance model. In this model the number of retarded births is adjusted by the regression of total on retarded births. The hypothesis that retarded births are independent of total births can then be tested by the regression slopes, while the hypothesis of seasonal variation would be tested by the ratios of the adjusted variances between monthly means and within monthly means.

Taking the scant data presented by Knobloch and Pasamanick the hypothesis was tested that the distribution of births by month for retarded children followed expectations formed on the basis of the distribution of births for all children. The proportion of children born for the state by month was used to compute expected number of retarded to be born that month and X^2 was computed between observed and expected number of births. The value of X^2 so obtained is 9.738. The value of X^2 needed to reject the hypothesis that the distribution of retarded birthdays is the same as that of all other birthdays would have to be 17.28 for d.f.$=11$ and $p \leq 0.10$. Hence, one may conclude that despite the trend of fewer births during the summer and more births during the winter months, there really is not sufficient evidence that the sample chosen could not have come from a population of birthday months which are distributed the same as birthday months for the total population. However, a note of caution needs to be sounded here, since the probability of similar distributions has been computed with a test of lesser efficiency than could have been done. It is possible, therefore, that in possession of all the data, one may yet obtain statistical significance. The question is whether it is worth while or not, particularly because of the small difference between the highest and the lowest month.

Considering the ratios of the Knobloch and Pasamanick data (reproduced in Table 1) it is found that for 100,000 children born in February, the highest month, and for 100,000 children born in August, the lowest month, the difference amounts to no more than 21 children. Since the average birth rate for the state of Ohio is approximately 10,000 per month, it would take a total of ten years before this difference between the highest and lowest month could be attained. Even if the rate of births should differ in the direction proposed, the effect is certainly trivial. Going by the maxim that there are small comforts in large differences beyond the fourth decimal it seems rather tedious and useless to apply additional statistical analyses.

In addition, it is well possible that the error introduced by birth registration is larger than the actual variations observed. It is common practice for birth statistics to be computed by the number of certificates filed each month and not by dates on these certificates. Since the certificates themselves may be within from two to five weeks late in filing, the error is very likely substantial. This would support, therefore, the contention that, with the exception of a very slight trend, the distribution of birth for feebleminded in time is quite possibly the same as that for the total population.

Sample Bias

Regardless of the pros and cons of the tests discussed so far, the validity of subjecting the data to statistical tests rests primarily on the assumption that the sample presented by the Columbus State School is representative of the population of retarded children in the state. More precisely, the assumption must be met first that the children registered in the institution are a random sample selected from the total population of retarded children in the state.

The authors are aware of that need

and discuss the possible selection of their sample from a particular socioeconomic grouping. While they cannot reject the hypothesis that the institutionalized children come from a particular social stratum in our society, they feel that this segment does not differ significantly in mating behavior from other social groupings. In addition, the belief is expressed that the admission policy of the institution does not select the sample in any way since the children must have reached age six before admission. However, neither contention is supported satisfactorily. Besides socioeconomic factors there appear to be two serious sources for bias in the sample.

1. Selection due to available space.
2. Selection due to differences in mating patterns.

Unfortunately the selection policy of the institution is not described. However, the limitation of space apparently restricted enrollment. The proportion of feeble-minded children appearing on the rolls in each year would therefore depend not only on the ratio of feeble-minded children to all births for each year but also on the variation of total number of births. If for one year the birth rate is largely increased, the proportional numbers of feeble-minded admitted would be smaller and for decreased total birth the proportion of feeble-minded children admitted would be higher. Whether such was actually the case here is open to speculation. Restricted admission may have led to a number of selective biases and the sample should have been compared with other data.

How limitation of admission may cause error in an analysis can be easily demonstrated. For example, defending the proposition that more intelligent children are born in cold months (i.e., just the opposite to the authors' hypothesis), evidence is sought in the first grade of private schools. The rate of children born in January, February, and March may simply be higher in the first grade of private schools because of admission policy of public schools. Public schools will not usually admit a child to first grade if he will not be six years old during the year of admission. The brighter children will be ready for the first grade at an earlier age but some will be too young to be admitted. Such children will find their way in increasing numbers into private schools that do not have the age restriction requirement. A check with a private school in Cincinnati revealed that six out of 15 children in the first grade were born in the months of January and February.

A possible bias in sampling can only be tested by repeated observations from the same population using different procedures of selection. Another sample of children diagnosed as retarded who sought counseling in the local clinic was examined. The months of births of these children are given in Table 3. It is obvious that the distribution in birth months of the Cincinnati sample do not conform to the distribution reported by Knobloch and Pasamanick.

Table 3—Birth Months of Children Diagnosed as Retarded by the Diagnostic Clinic for Mentally Retarded in Cincinnati

Years from 1939 to 1958	
Birth Month	Number
January	5
February	3
March	5
April	6
May	8
June	9
July	7
August	9
September	5
October	14
November	6
December	7

Table 4—Comparison Between Number of Babies Born Alive to Unwed Mothers and the Number of Retarded Births in the Columbus State School by Month and by Per cent of Total

	Number of Illegitimate Births	Per cent of Total	Number of Retarded Births	Per cent of Total
January	51	7.3	503	8.6
February	65	9.3	512	8.7
March	69	9.8	520	8.9
April	51	7.3	475	8.1
May	73	10.4	486	8.3
June	54	7.7	472	8.1
July	60	8.6	494	8.4
August	64	9.1	489	8.4
September	56	8.0	484	8.3
October	30	4.3	463	7.9
November	64	9.1	473	8.1
December	64	9.1	485	8.4
Total	701		5,855	

Another possible proof of bias may be found in the relation between illegitimacy and institutionalization. The hypothesis that feeble-minded girls may tend to more conceptions during the summer months appears logical, since the opportunity for promiscuity outdoors would be greater than inside the home with even minimal parental supervision. To test the hypothesis that illegitimacy is related to season of conception, records were assembled from a local hospital that devotes a large part of its maternity services to the care of unwed mothers. The emerging pattern for white illegitimate births conforms rather closely to the distribution of births for retarded reported by Knobloch and Pasamanick (Table 4).

While retarded births by month observed by Knobloch and Pasamanick do not differ significantly from the distribution of total births for Ohio, the similarity of the distribution of their retarded births to the distribution of illegitimate births in Cincinnati appears to be substantially better than the relation between retarded births in Cincinnati and illegitimacy. A nonparametric Rank Correlation Coefficient computed between illegitimate births and the Knobloch and Pasamanick data yield a value of $+0.454$, while its counterpart, computed between illegitimate birth and retarded birth in Cincinnati, yields a comparative value of -0.175. The latter finding lends weight to the contention that illegitimacy might have contributed to the trends observed on retarded birth in the Columbus State School. This is not to be interpreted as a supposition that seasonal variations affect illegitimacy, or that illegitimacy causes retardedness. It would be reasonable to assume that children institutionalized because they are retarded may also be children born out of wedlock and come from less stable households.

Logic of Testing Hypothesis

So far the discussion has been concerned solely with the validity of the statistical tests. The question as to whether these tests were applicable to these data is somewhat harder to answer. Statistical tests carry a certain neutrality and one may or may not apply them, provided that all conditions are met. To be meaningful, statistical tests must have their place in the scheme of the total experimental design and their application must be considered in the entire line of reasoning beginning with the necessity or plausibility of an hypothesis or prediction and leading to an acceptable conclusion.

In this respect the report of Knobloch, et al., deserves close scrutiny. The original hypothesis suggested possible effects of viral infections during the first trimester of pregnancy. The expectations were that since viral infections occur with greater frequency during the winter months more retarded children would

be born in the summer months. The appropriate statistical test therefore examined the hypotheses that can be stated as follows:

(a) The Null Hypothesis Tested: The average number of retarded children conceived in the winter months equals the average number of children conceived in the summer months.

However, a statistical test is designed to help the investigator make a choice between Alternative Hypothesis.

(b) The Alternative Hypothesis Tested (originally): The average number of retarded children conceived in the winter months is larger than the average number of retarded children conceived in the summer months.

Assuming now that all other conditions for a statistical test were fulfilled, the authors were committed to reject the Alternative Hypothesis if they accepted the Null Hypothesis or to accept the Alternative Hypothesis if they rejected the Null Hypothesis. However, the authors rejected the Alternative Hypothesis without accepting the Null Hypothesis. They introduced a post hoc Alternative Hypothesis after inspection of the data rather than before. This changing of horses in midstream may have some very peculiar effects, which unfortunately are not demonstrated very easily.

The logic of the test of significance rests on examining the possibility that some difference between two population parameters is due to chance and to state the exact odds for the hypothesis that an observed difference is really and truly a chance event. However, the Alternative Hypothesis makes no statement as to the source of the difference or its relevancy to antecedent conditions which caused such a difference to appear. The sole statement accepted with the Alternative Hypothesis is that the difference is real and reproducible at other samplings.

The acceptance of the Alternative Hypothesis depends, therefore, and somewhat conditionally, on the acceptance or rejection of the Null Hypothesis. (Taking the odds of 5/100 as a frequently used dividing line between acceptance and rejection of the latter hypothesis, it can then be stated that the danger of incorrectly rejecting the Null Hypothesis is 5/100, while the converse danger of incorrectly accepting the Null Hypothesis is not known.)

However, even here, the odds of incorrectly rejecting the Null Hypothesis may be meaningless if certain other conditions of experimental design are not met. Two such conditions may exist. The first is that other data on which a decision concerning the Null Hypothesis can be made are ignored. One such example was analyzed by the writer[9] in which he demonstrated that the policy of publishing only statistically significant results will lead to a state whereby the evaluation of a test of significance is meaningless. To some extent the authors are guilty of that error by omitting part of their data.

The second condition is somewhat different. The question is not so much one of how many data were ignored, but one of what aspects of difference in observations are subjected to a test. Let it be assumed that one samples the birth rate by month and year for retarded children without any prior hypothesis. Now it is quite clear that some months will show a higher birth rate and some months will show a lower one. Assuming a large number of ways in which months can be combined (i.e., hot vs. cold, early vs. late, containing holidays vs. not containing holidays, depression vs. prosperity, etc.), any one sample should yield a given number of differences which by statistical test will turn out to be significant at the 0.05 level. In fact, examining a sample on 100 such factors one should find at least five which yield spurious statistical significance.

There is therefore a danger in selecting some categories to test for difference

after the data have been collected. The hazard is that such differences are spurious rather than real and may be true only for this single sample.

Inferences are only possible if such data are demonstrably reproducible. The authors should have collected other data before reaching firm conclusions and, as it turned out, sampling among retarded in Cincinnati failed to verify the authors' findings.

One other source of proof can be used to justify unreplicated data. One can and should go to outside evidence that would compel the acceptance of the observations as both reasonable and in line with other phenomena that are observed with reliable frequency. How successful was the attempt made in that direction by Knobloch and Pasamanick?

One cannot deny the scientist the license to put together facts as he sees fit. The question really is whether or not some of the facts quoted or assumed by the authors will find agreement or even substantiation among other investigators. For instance, Knobloch and Pasamanick relate their findings to a postulated decrease in food intake by pregnant females during the hot months. No factual evidence is quoted to support such a contention. As the next step one may ask if such a decrease in food intake does occur is it sufficient to create a protein deficiency? Studies dealing with dietary deficiencies have almost always unearthed a deficiency of a substance necessary to maintain life in the total diet of a population . It is open to question whether a decrease in the intake of an otherwise adequate diet can bring about a serious deficiency as postulated by the authors. This seems especially questionable in the case of proteins. Proteins are the staff of life and are present, in some quantity, in almost all foods. The amount needed to sustain the life of an adult is small. Proteins can also be assembled in the body (something not true for vitamin deficiencies). That decrease in diet will lead to a disproportionate decrease in protein intake is a matter to be established from more weighty evidence than a conjecture that food intake may be restricted during the summer months.[6]

Related to this is the rather interesting and first assumption the authors make, namely, that viral infections are more prevalent during the cooler seasons than during the hot seasons. Recent observations seem contradictory or at least raise reasonable doubt concerning this commonly held belief. It has been demonstrated by several investigators that the incidence of many recognizable and distinguishable virus infections, particularly of the enteric group, may be greater during the summer than during the cold months of the year.[1,3-5,8] These may also damage the child in the utero. Had the authors approached the problem with this evidence, and the opposite hypothesis, namely, that more of the infants conceived in the summer are retarded than those conceived in the cold months of the year, their observations would have been more in line with their reasoning.

It is always easier to point to shortcomings than it is to make constructive efforts. Certainly one cannot detract from the contributions made by both authors in the past nor is such an intention indicated here. However, once an assertion is published it tends to linger in the collective scientific mind. The fact that such facts are not facts at all until reviewed repeatedly is overlooked so often as to become a commonplace.[10] The faults pointed out here are then not the exclusive property of the work of this instance, rather they are a demonstration that the roles of scientific reasoning in statistical testing must be defined clearly for each experiment. Perhaps they also point up the contention that one should not insist on answering biological questions solely by statistical manipulations.

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Training in Premature Care

The Children's Bureau and the New York State Department of Health are sponsoring for the twelfth time Institutes for Physicians and Nurses in the Care of Premature Infants at the New York Hospital-Cornell Medical Center. The curriculum is designed to meet the needs of physicians and nurses in charge of hospital premature nurseries and special premature centers, and of medical and nursing directors and consultants in state and local premature programs. Participants pay no tuition fee and stipends are provided to help cover expenses during attendance at the Institute. Institutes for 1960-1961 start on September 19, 1960, November 28, 1960, January 23, 1961, March 13, 1961, May 8, 1961.

Additional information from Institute in the Care of Premature Infants (Box 143), the New York Hospital, 525 East 68th Street, New York 21, N. Y.

This study was undertaken to determine the immunologic reactions to the administration of ether-killed Brucella abortus in man. The results appear to indicate that a favorable response was elicited.

RESPONSE OF INDIVIDUALS TO INJECTION WITH ETHER-KILLED BRUCELLA ABORTUS

I. Live, V.M.D., Ph.D., and B. Wolf, Ph.D.

IN PREVIOUS EXPERIMENTS on laboratory animals, injection of Br. abortus killed with ether had been found to confer protection against subsequent challenge with virulent Br. abortus.[1,2] In a further study[3] the killed vaccine with adjuvant appeared valuable in controlling an outbreak of brucellosis in cattle under field conditions. The present investigation was undertaken to ascertain the practicability of employing the vaccine for the protection of man. Volunteers in a penal institution were made available for the study.

Materials and Methods

Preparation of Ether-Killed Brucella abortus — A recently isolated CO_2-dependent strain of Br. abortus was used in the preparation of the whole-cell vaccine killed with ethyl ether. The cultures were grown on tryptose agar slants under 10 per cent CO_2 tension for 48 hours, and the growth was washed off with 0.85 per cent NaCl. The saline suspension of cells was removed, centrifuged, and the supernatant fluid was poured off. After resuspending and washing the organisms in saline once more, the sediment was finally suspended in 0.85 per cent NaCl; 50 per cent by volume of ethyl ether was added, and the suspension was stored in the refrigerator until used. When examined 24 hours after the addition of ether, the suspension was sterile, as determined by tests on culture media and by guinea pig inoculation. Before the addition of ether a small quantity of the bacterial suspension was removed, higher dilutions were prepared in tryptose-saline (0.5 per cent NaCl and 0.1 per cent Bactotryptose), and colony plate counts were made in tryptose agar to determine the number of brucella cells in the original suspension. Finally, merthiolate in a concentration of 1:10,000 was added as a preservative.

Saline-Vaccine — The suspension of ether-killed Br. abortus was diluted with 0.85 per cent NaCl to the desired concentration.

Alum-Precipitated Vaccine — The alum-precipitated vaccine was prepared, essentially, according to the technic of Harrison, et al.[4] The suspension of ether-killed Br. abortus was diluted with 0.85 per cent NaCl to the desired concentration. Then to each ml of saline suspension were added 0.027 ml of 10 per cent sodium bicarbonate solution and 0.25 ml of 4 per cent potassium aluminum sulfate solution, both having

been previously filtered through a Berkfeld N candle. Upon standing in the refrigerator a flocculent precipitate formed which was thoroughly resuspended before use.

Dosage and Route of Inoculation—In each instance 1 ml of vaccine, which contained 10^{10} organism, was administered intramuscularly in the deltoid region.

Intracutaneous Tests for the Detection of Sensitivity to Brucella Antigen—All volunteers were subjected to an intracutaneous test with brucellergen at the beginning, and only those showing no allergic reaction took part in the vaccination experiment. At the conclusion of the study, another brucellergen test was carried out to ascertain the effect of administration of the ether-killed vaccine upon the development of the delayed type of sensitivity. In each instance 0.1 ml of brucellergen was injected intracutaneously into the flexor surface of the forearm, and the reactions were recorded after 48 and 72 hours. No significance was attached to erythema alone, while the degree of swelling and induration was recorded as follows:

0.5–1.0 cm = +1; 1.0–1.5 cm = +2; 1.5–2.0 cm = +3; and swelling and induration more than 2.0 cm in diameter = +4.

Agglutination Tests—The tube method was used with the standard antigen kindly supplied by the U. S. Agricultural Research Service. In each instance the end titers of the blood sera were determined.

Opsonocytophagic Tests—These were conducted with citrated whole blood according to the technic described by Huddleson.[5] However, instead of using live brucella suspensions as recommended by Huddleson, ether-killed Br. abortus was used for this purpose. This procedure was decided upon after it had been found in preliminary tests in this laboratory that there was no difference in the phagocytic activity of blood samples whether live virulent Br. abortus were used or organisms from the same strain killed with ether. Jovar[6] found similarly that formalin-killed brucellae were just as suitable as viable organisms for the purpose of carrying out the opsonocytophagic test. One-tenth ml of citrated blood was mixed in a small test tube with 0.1 ml of ether-killed Br. abortus which had been suspended in saline and adjusted in density to compare with tube 16 of the McFarland nephelometer. The blood-brucella mixture was placed in a water bath at 37° C for 30 minutes, during which time it was shaken every ten minutes. Then smears were prepared and stained according to the technic of Calmette, Negre, and Boquet[7] as cited by Huddleson.[5] Twenty-five neutrophiles were examined and the degree of phagocytosis was recorded as follows, according to the method of Foshay and Le Blanc[8] as modified by Harris[9]: the cells which contained 1-20 brucellae were multiplied by one; those which contained 21-40 cells were multiplied by three; and those with 41 or more bacteria were multiplied by four. Thus if all 25 cells showed marked phagocytosis, the total score was 100.

Mouse Protection Tests — The white mice used in the experiments were from the same source and they weighed 18-20 gm. In each instance 0.3 ml of serum was injected subcutaneously into groups of four mice, and about 24 hours later they were given an intraperitoneal injection of virulent Br. abortus, which according to preliminary tests corresponded to about two MLD of culture. The time interval between the injection of serum and administration of the challenge dose was assumed sufficient to permit equilibration of the injected proteins in the body fluids of the mice. The blood sera obtained from the vaccinates at two-month intervals were stored in a deep freezer cabinet until used.

The culture used to infect the mice was a recently isolated CO_2-dependent strain of Br. abortus which was grown on tryptose agar for 48 hours. The growth was washed off with tryptose saline, and for the purpose of challenge the density was adjusted to correspond to the desired concentration of viable organisms on the basis of the McFarland nephelometer. Preliminary trials by means of plate counts had shown that a suspension of Br. abortus corresponding in opacity to tube No. 1 of the McFarland nephelometer contained approximately 10^9 living cells. In addition, plating of the organisms was carried out in each instance at the time of challenge to determine the exact number of organisms injected into the mice. The challenge dose was contained in 0.5 ml of the bacterial suspension.

Precipitation of Globulin with Ammonium Sulfate — This procedure was carried out in order to determine the role of globulin in the protection of mice. Serum was mixed with an equal volume of saturated ammonium sulfate, drop by drop, under constant agitation. Then the mixture was placed in a water bath at 37° C for one hour, whereupon it was transferred to a refrigerator overnight. Subsequently, the material was centrifuged at 1,500 rpm for 15 minutes, and the supernatant fluid was removed. The precipitate, which was resuspended in 0.1N NaOH in saline to the original volume of the serum, was dialyzed in the cold for 48 hours. The supernatant fluid, constituting the globulin-deficient serum was similarly dialyzed. To correct for the dilution factor, mice treated with the globulin-deficient serum were given twice the usual quantity, i.e., 0.6 ml instead of 0.3 ml.

Results

Preliminary Tests—One hundred and twenty-seven adult males ranging from 21 to 54 years of age were tested initially with brucellergen, and blood samples were obtained to ascertain the presence of detectable antibody by means of the agglutination tests and the opsonocytophagic tests. Nineteen individuals were positive to the intracutaneous injection of brucellergen, and over 50 per cent of these yielded a +4 reaction. Thus it would appear that a considerable percentage of the men had previously developed sensitivity to brucella antigen. According to the information regarding their past history, about 95 per cent of the individuals who were positive to the brucellergen test reported having had contact with farm animals. In the group negative to the intracutaneous test, only 38 per cent indicated that they had had such contact. The majority of the men who had had an association with farm animals also indicated that they had consumed raw milk some time in the past. The data pertaining to the brucellergen test are presented in Table 1. According to Spink, et al.,[10] 10-25 per cent of healthy adults in different parts of the United States give a positive reaction to the dermal sensitivity test for brucellosis. These authors consider it of the same significance as a positive tuberculin test; i.e., that such individuals have at some time in the past been exposed to brucella sufficiently to become sensitized. McCullough[11] also states that persons exhibiting dermal hypersensitivity to brucella antigen are regarded as having been infected at some time.

Table 1—Results of Initial Intracutaneous Test and History of the Individuals

Brucellergen Test	Number of Individuals	Per cent of Total Number Tested	Per cent Indicated Previous Contact with Farm Animals
Positive	19	14.96	94.73
Negative	108	85.04	37.96

Of the entire group only four showed

partial agglutination of their sera in a 1:20 dilution, one of whom was also positive to the allergic test. In addition, this individual showed marked phagocytic activity of the blood. All other blood samples were negative to the opsonocytophagic test. Thus in the initial test one individual, in addition to being positive to the skin test, exhibited pronounced phagocytosis and showed agglutination in 1:20 dilution of the serum; 18 men were positive to the brucellergen test only; and three had a low agglutinin titer without other reactions.

Serologic Tests One Month After the Initial Brucellergen Test—The purpose of this agglutination and opsonocytophagic test was to determine the effect of an intracutaneous injection of brucellergen upon the stimulation of antibody production. The only individual showing an appreciable rise in the agglutinin titer was the one who, in addition to being positive to the brucellergen test, had exhibited a high phagocytic activity of the blood and partial agglutination in 1:20 dilution of the serum initially. One month after the intracutaneous test his titer rose to 1:320. An insignificant change from negative to partial agglutination in 1:20 dilution of the serum was observed only in six other men, four of whom had been positive to the allergic skin test. In none of the men was there an appreciable change in the phagocytic activity of the blood between the first and second test. Thus it would appear that an intracutaneous injection of brucellergen does not ordinarily cause a rise in antibody, especially in individuals who are negative to the skin test. Other studies yielded similar results.[12,13,14]

Reactions Associated with the Administration of the Vaccine—Only those individuals negative to the brucellergen test were used in further studies. They were separated into two groups of 54 men each, which were injected intramuscularly with 1 ml of vaccine adsorbed on alum and vaccine in saline, respectively. One month later the latter group only was given another 1 ml dose of saline vaccine, and six months after the initial injection of vaccine, both groups received 1 ml of the respective vaccines. Thus one group was given two doses of alum-precipitated vaccine six months apart, and the other group received three doses of saline vaccine within the same time interval.

The reactions associated with the administration of the first dose of vaccine were in general very similar to those observed in immunization against typhoid fever, and no difference was noted between the alum-vaccine and the saline-vaccine group. There was tenderness at the point of injection, and about 17 per cent of the vaccinates experienced systemic reactions, in the form of fever and malaise, which began about 12 hours later and lasted from 12 to 24 hours. On the other hand, subsequent injections of the vaccine were followed by local reactions only, and some men were completely free of any discomfort. Thus it would appear on the basis of observations made on the two groups of vaccinates that systemic reactions, when present, were associated only with the initial injection of the killed brucella vaccine.

Postvaccination Studies — Although some of the vaccinates had been gradually discharged from the penal institution, the majority were still available ten months after the beginning of the study. However, during the next four months there was an appreciable decline in the number of volunteers at our disposal, after which almost the entire group had become dispersed. Therefore, the data presented extend over the 14-month period. Blood samples were obtained from the men at two month intervals; and agglutination tests, opsonocytophagic tests, and mouse protection tests were carried out. After the initial in-

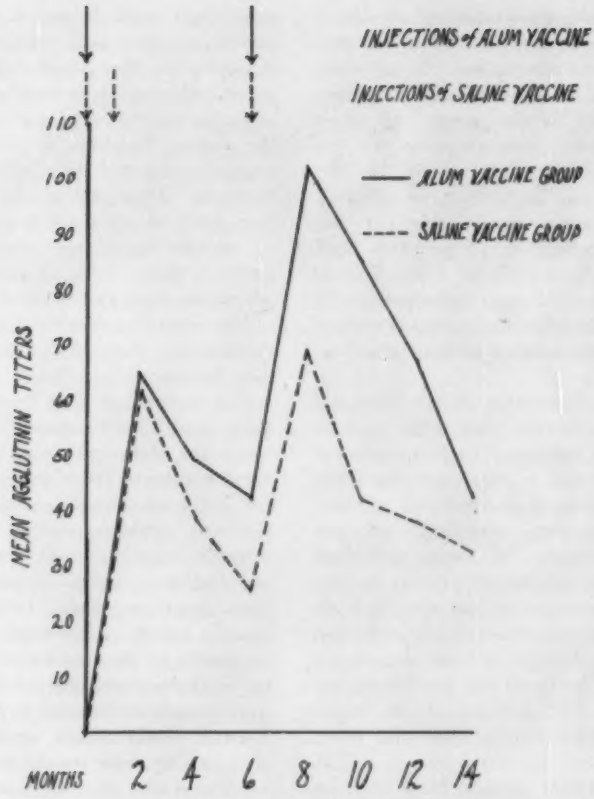

Figure 1—Agglutination Tests

jection of the vaccine the agglutinin titers were highest in the first test when they ranged from agglutination in 1:20 dilution of serum to that in 1:320 dilution, in both groups of vaccinates. Then the titers decreased in the course of the first six months, the decline being more pronounced in the saline-vaccine group. However, after the administration of a booster dose of vaccine there was a pronounced rise in the agglutinating activity of the sera, so that two months thereafter the mean agglutinin titers rose to about two and one-half times the pre-injection levels. Then there was again a gradual decline. The mean agglutinin titers for the two groups of vaccinates are presented in Figure 1.

While, with one exception discussed above, there was no significant phagocytosis observed in the original test, after administration of the vaccine there was a marked rise in phagocytic activity. In general, there was not a noticeable difference between the two groups of vaccinates. In each the initial rise was followed by a decline in the degree of phagocytosis between the first and third test. An injection of a booster dose of vaccine at this point, however, was fol-

lowed by an appreciable rise which exceeded the previous maximum as shown in Figure 2 which presents the mean phagocytic scores for the two groups. Subsequently, this high level of phagocytosis was maintained throughout the remainder of the study.

In the mouse-protection tests sera from each bleeding were used to compare their protective activity. Thirty serum samples, i.e., 15 from each group of vaccinates, were used; each sample being injected into four mice, which were subsequently challenged together with controls. The majority of the mice which succumbed to the infection died within several days; and, with one exception, all untreated control animals were dead ten days after challenge. Since the half life of globulin in the mouse is estimated to be only two days,[15] the serum-treated animals which survived the ten-day period were considered passively protected by the sera. Only a few animals died beyond this time interval. Thus, the criterion of protection was survival of the lethal challenge dose by the animals. In the analysis of the data the percentage of survival of each group of 60 mice is presented.

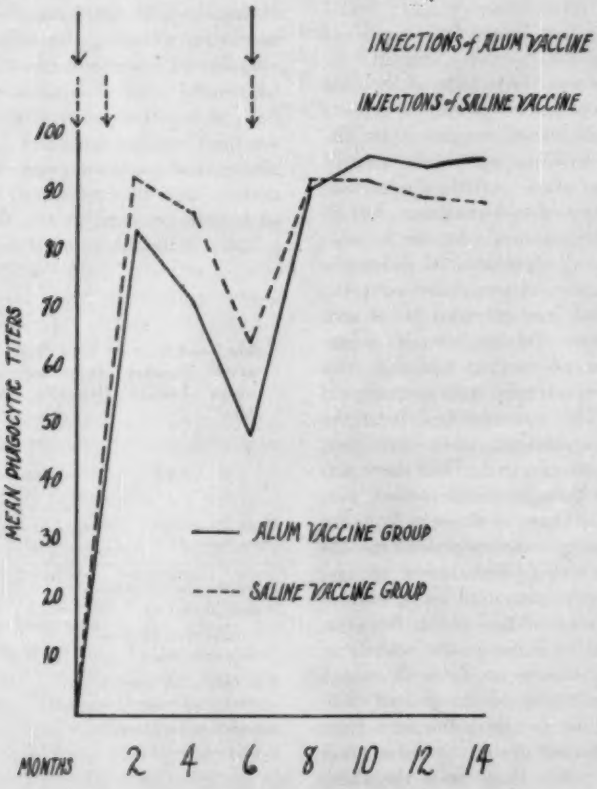

Figure 2—Opsonocytophagic Tests

Table 2—Effect of Sera from Individuals, after Initial Injection of Vaccine, upon Lethal Brucella Infection in Mice

Mice Treated with Sera Obtained:	Per cent Mice Survived Ten Days after Challenge when Treated with Sera from:	
	Alum-Vaccine Group*	Saline-Vaccine Group*
At time of vaccine injection	25.0	23.3
2 months after vaccine injection	91.7	85.0
4 months after vaccine injection	83.3	78.3
6 months after vaccine injection	75.0	43.3

* Each time 15 serum samples were injected into 60 mice. Nine of ten untreated control mice died.

Table 2 shows the results of the first challenge experiment. Here mice were injected with serum samples from the first four bleedings up to six months after immunization, and they were subsequently exposed to a challenge dose of 1.2×10^9 Br. abortus. As can be seen from the data, a pronounced difference in survival was observed between the animals which had received blood sera obtained from the individuals before the injection of vaccine and the mice which had been treated with postvaccination sera. The sera obtained from the vaccinates two months after immunization were most effective. Then there was a decline in their protective action, particularly in the case of the sera from the saline-vaccine group obtained six months after the initial administration of vaccine. The administration of a booster dose of vaccine at this point, however, was followed by a rise in the activity of the sera as shown in Table 3, which presents the results of the second challenge experiment. Here the sera from the saline-vaccine group showed a gradual decline, while those from the alum-vaccine group retained their protective capacity for the duration of the study. The challenge dose in this experiment was somewhat higher than in the first one, i.e., 1.6×10^9 Br. abortus.

The protective substance appeared to be associated with the globulin fraction, since precipitation of globulin by half saturation of serum with ammonium sulfate markedly reduced its ability to protect mice, while the resuspended globulin alone was comparable in activity to the original serum, as shown in Table 4. On the other hand, there was no correlation between the agglutinin titer and the protection afforded by individual serum samples, which is in accord with previous findings.[16]

Development of Sensitivity as a Result of Injection of the Vaccine—While all vaccinates were negative to the skin test initially, 84.4 per cent of 32 men tested 14 months after the initial administration of vaccine responded with local reactions ranging from +1 to +4. Sixteen men from each group were represented, and the reactions were somewhat more marked in the alum-vaccine group. Molinelli, et al.,[17] reported that

Table 3—Effect of Sera from Individuals, after Booster Injection of Vaccine, upon Lethal Brucella Infection in Mice

Mice Treated with Sera Obtained:	Per cent Mice Survived Ten Days after Challenge when Treated with Sera from:	
	Alum-Vaccine Group*	Saline-Vaccine Group*
2 months after booster dose of vaccine	88.3	85.0
4 months after booster dose of vaccine	90.0	75.3
6 months after booster dose of vaccine	86.7	65.0
8 months after booster dose of vaccine	83.3	51.7

* Each time 15 serum samples were injected into 60 mice. All ten untreated control mice died.

Table 4—Effect of Precipitation of Globulin, or Absorption with Br. abortus upon the Protective Action of Serum against Lethal Brucella Infection in Mice

Mice Treated with	Number of Mice Survived Ten Days after Challenge*
Original serum	7
Serum after precipitation of globulin	2
Precipitated globulin resuspended in saline	8
Untreated controls	0

* Ten mice in each group.

in their experience parenteral injection of heat-killed whole brucellae, or filtrates of broth cultures (brucellin), did not produce cutaneous allergy, concluding that such sensitivity in man is only the result of infection with live brucellae. Feeding of dead organisms has also failed to develop sensitivity to brucella antigen.[18] Griggs[19] states that in man a positive skin test means either past or present infection. Thus the ether-killed vaccine differed from other nonviable brucella products by establishing dermal hypersensitivity.

Discussion

The evaluation of an immunizing agent against brucellosis in man is very difficult because definite proof of resistance to this disease can be obtained by challenge only. Thus, Howe, et al.,[20] discussing infection among laboratory workers engaged in brucellosis work merely report: "A Brucella vaccine was given to all members of the laboratory group, including the 17 who subsequently contracted brucellosis. Vaccination produced changes in the agglutination reaction and the opsonocytophagic index and may have altered the course of illness." Recently immunization of human beings with living Br. abortus of reduced virulence was reported.[21] However, the Brucellosis Committee of the World Health Organization in its latest report[22] considers such a procedure as being still in the experimental stage. The report indicates further that more information is desirable concerning the relative hazards of immunization with a living culture, since Br. abortus, strain 19, is known to have caused severe illness in veterinary personnel accidentally inoculated and in laboratory workers handling cultures of this strain.

As far as is known, no immunization studies have previously been carried out in man with ether-killed brucella. The present investigation was undertaken after it had been found that the ether-killed product, particularly when combined with adjuvant, had proved effective in protecting guinea pigs against subsequent challenge with virulent Br. abortus.[2]

Each injection of the vaccine into the human volunteers was followed by a rise in antibody. While an increase in agglutinins and opsonins cannot be considered of definite immunological significance in brucellosis, the rise in protective substance, as shown in the mouse experiments, may be associated with resistance against brucella infection. Comparative studies showed that the alum-precipitated vaccine was more effective in stimulating the height and persistence of the protective activity than the saline-vaccine. In a previous study[16] sera from animals injected with ether-killed Br. abortus combined with adjuvant were also found to protect mice against lethal brucella infection. The protective substance appeared to be associated with the globulin of the serum.

Since the establishment of tuberculin sensitivity in connection with injection of BCG is considered indicative of successful immunization, it is a matter of speculation as to whether the observed development of dermal sensitivity to brucellergen, after injection of the ether-

killed Br. abortus, has similar immunological significance.

Summary

The object of this study was to determine the effect of administration of ether-killed Br. abortus with respect to resulting reactions, as well as the serologic and immunologic response in human beings.

In an initial test with brucellergen, 14 per cent of the adult male volunteers were found sensitive to brucella antigen. Those negative to the intracutaneous test were divided into two groups, which were injected intramuscularly with ether-killed Br. abortus vaccine on alum and in saline, respectively. The alum-vaccine group was given two doses six months apart, while the second group was treated with saline-vaccine three times within the same period.

The reactions associated with the initial administration of the vaccine consisted of local tenderness, and in a small percentage of the vaccinates there were also systemic reactions of short duration. Subsequent injections of vaccine were associated with local reactions only.

In the course of 14 months periodic serologic tests were carried out, as well as mouse protection tests with the sera. The initial injection of the vaccine was followed by a rise in agglutinin titers, in the opsonocytophagic activity of the blood, and in the ability of the sera to protect mice against subsequent challenge with virulent Br. abortus. Then there was a gradual decline in the antibody response. A booster dose of vaccine, however, resulted in a renewed marked stimulus of antibody production.

While antibody titers determined by serologic tests in vitro are not considered criteria of immunity in brucellosis, the observed rise in protection afforded by the sera against lethal infection in mice may be associated with increased resistance of the vaccinates. The alum-precipitated vaccine proved more efficient in stimulating the production of the protective substance.

A large percentage of vaccinates developed dermal sensitivity to brucella antigen as a result of injection of the ether-killed brucella vaccine, which may be of immunological significance.

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A preliminary report on this work is in press in the "Bulletin of the World Health Organization."

Seminar on Urban Public Health

The Communicable Disease Center, the Illinois State Department of Health, and Southern Illinois University Department of Community Development are sponsors of a seminar on Urban Public Health and the Residential Environment to be held at the university in Carbondale, August 8-12.

The seminar has been evolved from the two-week experimental course on Housing Hygiene and Urban Renewal conducted in 1959 under the co-sponsorship of the Yale University Department of Public Health and the Communicable Disease Center. This year's course is a refinement of the first curriculum, and will include such topics as: Public Housing of the Future, Relocation Programs and Problems, Housing Survey Methods, Code Enforcement Programs, Housing the Elderly and Chronically Ill, Socio-Environmental Aspects of Mental Health, and Citizens' Participation.

Specialists from several state and city programs, from universities and the PHS will act as faculty. Tuition is free, but persons attending must defray living and travel costs. Applications to chief, Training Branch, Communicable Disease Center, 50 Seventh St., N.E., Atlanta 23, Ga.

EDITOR'S NOTE: Information was received too late unfortunately for inclusion in the June issue of the Journal of a notice about the same sponsors' course in the APHA Housing Quality Appraisal Technique, running from July 11-August 12. Subject matter of this course includes sampling procedures, field inspection procedures, office processing of field data, coding and punching for permanent card records, appraisal of neighborhood environment, and the analysis and interpretation of data.

In the decade since it began its work, the Committee on Maternal and Child Care of the American Medical Association has been active on a number of fronts. The story of its activities and achievements is told in this article.

ACTIVITIES OF THE COMMITTEE ON MATERNAL AND CHILD CARE OF THE AMERICAN MEDICAL ASSOCIATION

Philip S. Barba, M.D.

AUTHORIZED in 1948 and its members appointed in 1949, the Committee on Maternal and Child Care began active work in 1950 under the chairmanship of Woodruff L. Crawford, M.D. The functions of the committee have been defined as follows:

To keep informed on programs, studies, and research designed to improve maternal and child care.

To compile and publicize this information so that others may utilize it to the best advantage.

To endeavor to coordinate the efforts of, and to effect liaison with, other groups working on these problems.

To serve as a center for the compilation and distribution of studies and programs promoted by the committee and carried on by similarly titled committees of state and county medical societies.

The members of the committee are appointed by the Council on Medical Service and throughout its existence have been representative of the various medical interests involved in the functions just outlined. Generalists, obstetricians, pediatricians, internists, dentists, and public health physicians have accepted such appointments. Consultants have included other physicians in these fields and also hospital administrators, statisticians, lawyers, representatives of other national organizations, and of federal agencies.

In 1950, because of the "police action" then going on in Korea, the armed forces of the United States were being augmented and kept at a high level of enrollment. There was some discussion of the need for medical care of dependents of service men and of legislation similar to the Emergency Maternal and Infant Care Program of World War II. Remembering the dissatisfaction with that program expressed in some areas, an early activity of the Committee on Maternal and Child Care queried the various state medical societies regarding their experience with EMIC and their suggestions for improvement if such a program became necessary. Using the information obtained, which revealed some wide differences of opinion and experience, committee members were able to participate effectively when officials of the Children's Bureau of the

Department of Health, Education, and Welfare asked for a conference of representatives of the major health and hospital organizations, and other groups involved in the services that would be required if another EMIC program should be instituted. The conferees were able to agree on broad policies which should be borne in mind to prevent the difficulties previously experienced when formulating regulations, if Congress decided such a program was necessary.

After subsequent meetings with representatives of national organizations called together by the committee revealed a sense that existing conditions did not indicate a need for such a program, the committee instigated a study of conditions in an area with a large population from the armed forces. The Research Department of the Welfare Council of Metropolitan Los Angeles was engaged to investigate the medical and hospital obstetric care of dependents of local service men. This study indicated that such care was usually quite adequate but that there was a need for better information services and better contact with the families who needed such care. Another interesting finding was that while medical and hospital care were only occasionally a problem, there was a real need for more and better ancillary aids such as counseling, day care, "homemaker" services, and the like. Results of this study were published in the Journal of the American Medical Association.[1,2]

Convinced that in many areas excellent work was being done in the field of maternal and child care and that in other areas there were dedicated people interested in the problems existing in their counties and states, the committee next instituted a study of maternal and child care programs existing in several areas. It was hoped that publication of articles on these programs would stimulate increased activity and would alert those already working to the pitfalls and stumbling blocks which others had encountered and solved. This study was done in Connecticut, Indiana, Nebraska, and Michigan and included such items as the programs for school health, dental care, crippled children, rheumatic fever, child guidance, care of prematures, and in some areas special programs such as the Michigan Study of Endemic Goiter. In most instances the study included one or more communities within the state with presentation of statistics, surveys, and programs similar to those in the survey of the state as a whole. Also included were the roles of the voluntary organizations and of the governmental agencies. The summaries of these studies were published in the Journal of the American Medical Association.[3-6] The interest in these articles and the inquiries received indicated that this was an area in which the committee could be of service to interested committees in the constituent organizations. To this end a study of several active maternal mortality committees was instituted and summaries of these programs were also printed in the Journal of the American Medical Association.[7-13]

These studies demonstrated certain differences in definition and terminology which negated complete comparability. Other reports showed similar variations in terminology and in approach to the problem. Regional meetings with representatives from State Medical Societies and State Health Departments close to the place of meeting demonstrated a desire for some uniformity in such studies and resulted in a series of conferences with representatives from the various specialty organizations and from committees working on maternal mortality. In these meetings it was possible to work out mutually acceptable agreements on terminology and definitions. These definitions, the terminology, and the summaries of the seven studies of working committees have been published

in "A Guide for Maternal Death Studies" (1957). In addition, the committee and its staff have compiled an appendix of sample forms, letters, charts, and so forth, which have been made available on loan to committees in process of organization or reorganization.

Publication of this "Guide" was followed by a change of focus to the study of perinatal mortality and morbidity. Here again studies were already in progress. Again the committee instituted a survey of these active groups by Don Berg, research associate of the Council on Medical Services. Summaries of the work of the Philadelphia Neonatal[14] Mortality Study, the Philadelphia Study of Fetal Deaths,[15] the Hennepin County (Minn.) Perinatal Mortality Study,[16] the Perinatal Mortality Study of the Doctors Hospital in Seattle,[17] and the early Neonatal Mortality Study in Delaware[18] were published in the Journal of the American Medical Association. Conferences of representatives from national organizations, state societies, working committees, the National Office of Vital Statistics, and others were held in Philadelphia, Chicago, and Washington in an attempt to clarify terminology, definitions, and procedures. The blending of suggestions made in these meetings and in meetings with state groups resulted in "A Guide for the Study of Perinatal Mortality and Morbidity," a publication of the Committee on Maternal and Child Care of the Council on Medical Service. The committee is now working on an appendix to this guide which will offer charts, summary sheets, and code sheets for study of individual cases at the hospital, county, and state level as appropriate. Creation of such committees will lead to self-study and analysis by individual physicians, hospital staffs, and communities, which is certain to produce a favorable effect on the incidence of perinatal mortality and morbidity. Uniformity of reporting and of definition will increase the usefulness of data published by such study groups.

In conclusion, I hope I have indicated some of the activities by which this committee of the Council on Medical Service of the American Medical Association has endeavored to help the constituent organizations carry out our traditional ideal of better medicine for more people. Recognition of cooperating groups and individuals expressed in the guides I have named in this paper would not be complete without also expressing recognition of the dedication of the many physicians in these societies who are anxious to use any help we can give and those who sacrifice their time to put their special knowledge to use in the service of the rest of us. I want also to express our recognition and gratitude to the staff of the council, particularly George Cooley, Don Berg, and Alma Jensen.

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Education

"The central nervous system contains about 10,000 million nerve-cells, most of which communicate with a large number of others. . . . Presumably one cell may be involved in many different networks, and, indeed, the highly intelligent may learn how to use their available nerve-cells for a larger number of separate tasks than other people.

If children are to develop certain personal qualities and an interest in learning their parents should realize the importance of encouraging certain feeling responses from the earliest months of life. Traditions, loyalties, and beliefs of family and community can all be harnessed with advantage to encourage what is best for all.

Clearly if we wish to make human life something more worthwhile than it now seems to be for many people, we must attempt to comprehend the incredible possibilities for development that are present in every child's brain."

(Brain. Memory. Learning—By W. Ritchie Russell, M.D. Oxford University Press, 1959, p. 128, et seq.)

Alcoholism is not a strictly delimited disease entity, but rather a social problem intertwined with many other problems. For this reason, contends the author of the following paper, there can be no one community agency alone whose responsibility it is to work with the alcoholic. The basis for this position is presented, and the consequences that follow are discussed

THE ALCOHOLIC AND HIS COMMUNITY SEARCH FOR HELP

Genevieve Burton, R.N., M.P.H., Ed.D.

IN ITS EFFORT to respond to the needs of a society daily increasing in complexity, the field of public health has necessarily expanded to include work with a variety of community problems which earlier were not considered to be under public health jurisdiction. Outstanding among these problems is alcoholism. Because alcoholism and its many ramifications undermines the economic, social, and health structure of our society it is no longer considered a problem solely of the individual and his immediate family. Alcoholism has many facets. It is a problem of individual health, both mental and physical; it is a problem influencing the mental, spiritual, and emotional health status of the entire family; it is a social and community problem because the results of individual and family disintegration place a burden of responsibility on the community-at-large; it is an economic problem in the loss of income and manpower and in the cost to the public of rehabilitation, medical care, court processes, and imprisonment. For all of these reasons, in addition to the increase in prevalence, alcoholism is a public health problem of major importance.

Although public enlightenment about alcoholism is on the increase, there are communities in which resources where the alcoholic or his family might turn for help are either lacking or inadequate. One question which might profitably be considered is what kinds of community resources or agencies are equipped to work with the problems of alcoholism. Obviously, if help for the alcoholic and his family requires the services of medical or psychiatrically oriented institutions, or public health agencies with facilities designed and personnel trained to cope specifically with alcoholics, many communities will be unable to respond to the alcoholic's call for help. It is possible, however, that many community resources, individuals as well as agencies, whose work is not focused on the problems of alcoholism, may have vital contributions to make in helping the alcoholic. It is the purpose of this paper to describe how one community agency, within the context of its own relatively circumscribed function, contributed both to research about alcoholism and to the alleviation of some of the problems of a group of alcoholics and their families. Admittedly,

this agency is located in a large metropolitan area where many health and welfare resources are available. But the presence of these other resources had no direct bearing upon the work the agency was able to do both in terms of research and in giving help to the individual alcoholic and his family. It is conceivable that similar help could be offered the alcoholic by many agencies not located in an urban area.

The locale of this research project was a marriage counseling agency* in which the focus of counseling is the interaction between the partners, either premaritally or in troubled marriages. The agency in 1954 undertook to study the interrelation between problem drinking and marital conflict. The research subjects in the project were thirty-three alcoholic husbands and their non-alcoholic wives who were in need of counseling help with their marital problems.† At this initial contact with the agency the research project was explained and the willingness of the clients to cooperate in supplying the desired data was ascertained. Data was obtained in the counseling interviews and through the administration of selected projective tests and personality inventories. Although alleviating the alcoholic problem per se was neither a usual function of the agency nor an objective of this research, there were several instances in which the alcoholic problems appeared to be lessened as a result of counseling. It is this experience which prompts the supposition that other community agencies may be able to contribute to a decrease in alcoholic problems, although focusing on problems of a different nature while performing their principal functions. Where alcoholism exists, it is all-pervasive of the individual. It impinges upon his individual existence, upon his family relationships, his social life, his community responsibility, and upon his employment. Thus, it is inevitable that any helping agency or individual focusing upon any of these dynamic areas of life and living will touch upon the peripheral problem of alcoholism as well.

To the community wanting to tackle the problem of alcoholism, it should be significant to know what resources an alcoholic or his family attempt to use and their reactions to seeking help and to the kind of help they receive. Information pertinent to the concern of this paper is available in the records of twenty-five of the couples in the aforementioned research project. These have been studied to ascertain how the clients felt about coming to the agency initially, what feelings were in evidence during the course of counseling, and what immediate results were apparent at the end of the contact with the agency. In addition the records reveal some of the feelings the clients had about seeking help elsewhere, prior to their contact with this agency. Obviously, these observations were subject to the interpretation of the individual counselor who wrote the record and to the later interpretation of the written record by the writer.

Of the 25 couples in question, there were four who broke their contact with the agency after three interviews or less. Two of these couples decided mutually with the counselor against returning. In the other two instances it was the husband in one case and the wife in the other who initiated the break. Three of these four couples having minimal self-motivation were compelled by the Municipal Court to come to the agency as part of probation. Except for these

* Marriage Council of Philadelphia, Inc. The operational unit of the Division of Family Study in the University of Pennsylvania School of Medicine's Department of Psychiatry.

† For a detailed description of the methodology of the research project see, The Development of a Research Methodology for Achieving the Cooperation of Alcoholics and Their Nonalcoholic Wives. Mitchell, Howard E., and Mudd, E. H. Quart. J. Studies on Alcohol 18, 4:649-657 (Dec.), 1957.

four couples who broke their contact before completing the research requirements, the average number of interviews per person was nine, although the range of the number of interviews was from 4 to 20. Among these 21 cases the termination of counseling was instigated by the wife alone in one instance, by the husband alone in three instances, and mutually in one instance. The termination of counseling in all the other cases was the result of joint planning between counselor and couple or was the result of external circumstances, i.e., moving away or illness.

On the whole, the alcoholic husbands gave the impression of being more comfortable about seeking counseling help than did the wives. Half of the wives felt apathetic and indifferent or hopeless about the outcome. Only two of the husbands expressed similar feelings. Two wives verbalized the fear that counseling might make things worse. In each case the fear was related to the wife's anxiety about stirring up experiences and feelings she had deliberately suppressed and wanted to keep suppressed. Characteristic of one-quarter of the husbands were extreme, unrealistic efforts to create a favorable impression on the counselor. As counseling progressed, six of the husbands exhibited resistance to coming by canceling or changing appointments, forgetting them, or coming late. Rarely, among the husbands, were there overt signs of resistance or hostility. Only one husband overtly or implicitly criticized the counselor or her methods, whereas criticism or hostility was directed at her quite openly by five of the wives. Three husbands and three wives (not couples) expressed resentment several times not at the counselor or agency, but at being in a position where counseling help was necessary. Willingness to participate was demonstrated by 17 of the husbands and 14 of the wives in the completion of the lengthy schedules and psychological tests in addition to the necessary counseling interviews.

Although a careful follow-up of these cases has not been undertaken, letters asking about their current situations were sent out prior to the closing of each case. There have been eight telephone or mail responses from wives and six from husbands since that time. Thus, responses have been received from 14 of the cases, since in no instance did both partners respond. Based on these responses and on observable conditions at the termination of counseling the following results seem apparent (once again limited by the author's subjective interpretation): In the marital relationship there was some discernible improvement in approximately one-third of the cases. For example, by the end of the agency contact, seven of the couples were beginning to talk things over, a rare phenomenon for them prior to counseling. Considering the individual, apart from marital interaction, there was improvement in the ability to adjust and to find increased satisfaction in life in an additional four of the women and three of the men. Among the balance of the clients, those who did not receive noticeable help either in the marital situation or in their individual adjustment, eight of the wives and five of the husbands appeared to find comfort and support in coming for counseling. In nine of the cases in which there had been excessive drinking prior to or during the early counseling contact, drinking had either decreased significantly or there was total abstinence.

This last point is of particular significance in regard to a community's concern with alcoholism. It is not intended to imply that decrease in drinking was the result solely of marriage counseling. Some of these cases had become active in Alcoholics Anonymous either shortly before or after the beginning of counseling. This activity undoubtedly was a major contributing fac-

tor in the achievement of sobriety. What this fact does suggest, however, is that because alcoholism impinges upon, and is influenced by, an individual's total life-processes, any agency or individual with something to offer the alcoholic in any of his significant life areas is potentially in a position to aid indirectly in the alleviation of the alcoholic problem. Although not proved by the research project summarized here, it is not only conceivable, but probable that finding some outlet to relieve the tension created by marital problems enabled some of these alcoholic husbands to maintain a desire for sobriety which previously had not motivated them. In other words, it is reasonable to assume that while Alcoholics Anonymous, or some other force, was responsible for achieving sobriety, counseling the alcoholic spouse together with his partner offered enough support to enable the client to maintain sobriety.

The foregoing summarizes the work of one agency with a group of alcoholics and their families. Since the focus of this paper is on potential community help for the alcoholic, these same cases were studied to learn as much as possible about other community contacts they had had. The records of the group indicate a number of efforts to find help from other sources.

Some of these were the referral sources for the clients coming for counseling. With the exception of one couple who were self-referred, each case participating in the study was referred by a person or agency to whom the alcoholic turned, or was sent, for help. Thirty-two per cent of the couples were referred by the professional personnel of counseling centers or clinics.* Of the 32 per cent some were court cases, others came to the agency voluntarily; the municipal court directly referred 20 per cent; various professional people in private practice referred 24 per cent. Nonprofessional people with an interest in the problem of alcoholism, e.g., Alcoholics Anonymous, referred the remaining 24 per cent.

Prior to referral for marriage counseling, these alcoholics or their wives had applied for help from various sources. Sixty-eight per cent of the clients had sought Alcoholics Anonymous help, some being active at the time of their coming for marriage counseling. Help from professional people in private practice was sought by all of the couples, some of these clients having turned to more than one among the professional group, e.g., ministers, physicians, lawyers, etc. Eighty per cent of the couples had contact with municipal agencies, such as the police or court psychiatrists. Other community agencies were used by 36 per cent of the group. In addition, 12 per cent had tried to obtain help from neighbors, friends, or relatives.

The determination of the kind of help received from these other agencies and the client's reaction to the experience was not a part of this research. In the course of counseling, however, occasional references were made to such experiences. The clients' comments may have some significance for those community agencies and individuals concerned with aiding the alcoholic and will be mentioned briefly. In considering the reaction of these clients to their previous community contacts, the data though limited require qualifying. These are people who by and large had not been helped. Certainly they had not received enough help to alleviate their problems, or they would not have needed to come to a counseling agency. Nor is there any implication that their failure to receive help or to utilize it was the fault of the helping agency. Where the clients were not helped it was, without doubt, partially due to a lack of motivation or

* Two of these centers were the Pennsylvania Alcoholic Counseling Center and the Alcoholic Unit of Philadelphia General Hospital.

readiness on their parts. But because most of them were not helped and had not enough insight to know why this was so, they represented a strongly biased group as far as their previous experiences were concerned.

The material which follows does raise an interesting question. Is it possible that individual reaction toward help in these experiences might have been more favorable if the attempts to help had involved both husband and wife? Might it have made a difference in the outcome if both sides of the picture had been presented, if both partners had been heard? The data collected in this research project strongly suggest that working with both husband and wife in a situation complicated by alcoholism has distinct advantages.

Reaction to Alcoholics Anonymous varied, quite understandably, with the degree of success achieved. Those clients who were very active in AA and had achieved sobriety through AA help were high in their praise of the work. The clients who had not persisted with AA activity had either strong negative feelings or were indifferent toward it. Certainly work with this small group of alcoholics bears out the AA contention that success through AA is dependent upon wholehearted effort. Even in the successful cases, however, it is not always a case of "love at first sight." Several of the active AA members gave a history of being in and out for several years before finally sticking with it. Others who had only toyed with the possibility of turning to AA did so following a crisis or traumatic experience, such as going to jail, doing violence to family members, or becoming ill. Some of the initial resentment alcoholics feel toward AA seems to be related to not wanting to listen to the experiences of others. This probably is a rejection of their own alcoholism. Apparently hearing AA testimonials is a constant reminder to the beginning member that he is now an integral part of a group of alcoholics, and he is not yet able basically to accept this fact. One client told the counselor that AA was "good for some people, but not for me." Another client was "fed up with having my leisure time taken up wth compulsory meetings." Still another said he did not find AA activities stimulating. One man expresses the feeling several of the alcoholic clients have implied when they felt pressured. "I won't change until I'm ready." A more hopeful note is that of the 17 marriage counseling clients who had had some contact with AA, eight of them with the help of AA were maintaining sobriety at the conclusion of their counseling contact. One man who had resisted AA efforts for three years finally became an active member almost to the point of fanaticism about the organization. An interesting sidelight on AA activity as it related to marriage was the tendency in two cases for the wives to become extremely jealous of the husband's AA interest.

Another potential source of help for the alcoholic has not had, according to the clients in this study, as high a degree of success as has AA. Of the seven clients who previously had some contact with psychiatry, only one expressed a positive reaction to the experience. This man said that while psychotherapy had not helped him with his drinking problem, it had helped him to understand himself. Hopefully, in this case, an alleviation of the drinking problem might be expected to follow later. One man was rather apathetic about his work with a psychiatrist, while his wife was more outspoken; her comment was that she was "damn fed up with psychiatry!" One client who felt negatively about his psychiatric experience believed it was because he "felt pushed into it." Another man indicated he was threatened by a court psychiatrist with two years at a state mental hospital; this filled him with panic as well as hostile feelings

toward psychiatry. The remaining three clients merely felt that their contacts with psychiatrists had not helped them in any way.

The reports of reactions to and results of experiences with physicians and hospitals were also quite varied. When the client had seen a doctor or had been hospitalized for an acute alcoholic episode or for a physical condition not specifically related to alcoholism the reactions were favorable. In some instances the reactions were justifiably negative. One client reported that his doctor felt he was lying and the doctor lectured him. Another man found the doctor arrogant and dictatorial. One situation in which medical help was sought involved the wife rather than the alcoholic husband. This woman had had a previous psychotic break and was again experiencing "nervousness, tension and weak spells." Her current condition was blamed by the doctor on her husband's drinking. She was given sedatives, but no efforts were made to understand or to alleviate the home situation. Another doctor, according to the record, told the wife to plan every minute of her husband's day and to be with him as much as possible to prevent his drinking. This was the advice to a woman who was already having severe marital difficulty! On the positive side there is a referral by one doctor of a couple to a family service agency. Another client went regularly to a doctor specializing in the treatment of alcoholics and found it a satisfying experience. In another case, the client was referred by his doctor for hospitalization in a state hospital. The client, even though a relatively troubled person, went willingly. Following his discharge he has accepted the treatment and suggestions of the doctor who maintains a good relationship with both husband and wife. In their mutual problems the doctor offers much needed support and understanding. This is possible because the doctor and his guidance are accepted by both partners. Such a situation provides a good illustration of the value of working with both husband and wife.

Other sources of help occasionally used by the alcoholic and often used by his family were the police and the court. When the police were called it was usually by a family member because of violence during an acute alcoholic bout. In one of these cases where the wife was frequently compelled by her husband's violence to turn to the police, the wife felt that the police "leaned over backward" to be considerate of her husband and made sincere efforts to get him to stop drinking. This man, one of those who achieved sobriety, agreed in his sober moments that this was true. He was extremely grateful for the efforts of the police in his behalf. While most of the alcoholic clients did not actually give the police or the court any credit, neither were they particularly hostile toward the law-enforcement personnel. This fact does not mean that the men were not resentful or bitter about arrest, probation, and/or imprisonment, but their resentment almost invariably was directed toward the wife. In two instances, for example, where there had been previous arrests resulting in probation, the men broke the probation by becoming drunk. In both cases the wives persistently maintained, even with the counselor, that they had had nothing to do with the rearrest, but the husbands were totally disbelieving of that. They clung tenaciously to the mistrust and resentment that had been built up.

One man, who was particularly resentful, felt that if positions were reversed he "would rather help someone than send him to jail." In another situation the whole environment was extremely pathological. There were frequent episodes during the husband's drinking bouts of extreme and dangerous violence to both wife and children, in addition to severe economic deprivation. Strangely

enough, in this case the wife herself felt she did not want to send her husband to jail if there were any possible chance of referring him to some source where he might receive help. It apparently is not possible to predict a reaction to arrest and imprisonment. One man became an active AA member as the result of spending a night in jail. Another man whose week end in jail was followed by compulsory hospitalization and treatment became much worse, eventually having a serious entanglement with the law on a charge of car theft. At least three of the wives who had their husbands arrested regretted it, because they "didn't realize it would be so complicated." There are two possible reasons for the regret. One is that the wives, in their desperation to find relief from intolerable situations, did not anticipate the intense resentment of their husbands. Feeling justified themselves, they expected their husbands when sober would understand their justification. Unfortunately, the husbands when sober were even less able to accept the shame and humiliation of arrest. The other "complication" the wives had not anticipated was being compelled to accept, or at least to present themselves for, marriage counseling. This necessarily meant having to look at their own contributions to the marital problems and was not easy for them to take.

Both positive and negative results grew out of police and court experiences. Among the former were: the threat of divorce, ending in a master's hearing, motivated one client to achieve and maintain sobriety; several couples were referred for marriage counseling; one man maintained sobriety simply because taking a drink would mean going to jail. Negative results were, in part, a lack of clarification of aims. For example, one man was classified as an alcoholic because his wife had mentioned drunkenness to the court when she was attempting to obtain a court order for support. He was hospitalized and treated for alcoholism even though the hospital did not feel he was an alcoholic! (This man drank, but not in the compulsive pattern of the alcoholic. His wife, who "ran around" at night and neglected the children actually drank as much as he did.) Another couple who came to the agency independently of their court contact were told by a court worker not professionally trained that they should not have come for marriage counseling, that he himself was a marriage counselor and qualified to help them. In another case, the husband was told by someone at court that one "could tell just by looking" at him that he was an alcoholic. A statement that implies guilt on the basis of appearance alone is not going to promote the client's (or defendant's) faith in the court.

Other sources of help to which the alcoholic turned were the clergy, family service organizations, and friends and neighbors. One wife said she went to everyone she heard about who might be able to help. Another wife referred by the doctor to family service feels they helped to put her "back on the road to reason." Others did not find family service helpful. In one instance the wife visited the family service worker for nine months, but her husband refused to go and resented her going. Another wife had no confidence in what they could do. Still another said they received no help; the worker "just wrote everything down and reached no conclusions."

Discussing the problems with clergymen apparently had little to offer in this particular group. One husband was better for five or six weeks following such a conference and then became much worse. Another couple had several contacts with clergymen. One time the wife became angry because the clergyman reminded her of her responsibility in the marriage. Another clergyman irritated the same woman by disagreeing

with her that there was something wrong with her husband's mind. A third clergyman made her feel better because he pointed out to her husband "how wrong he was." The husband did not indicate how he felt about these conferences. Presumably he agreed with the first two and not with the third. Again, the value is pointed up of working with both partners. Other wives have turned to neighbors in time of need, particularly when violence was involved. A husband may have summed up the feelings of many of these men when he said he feels that people consider him a bum now. Friends and neighbors in the community think he let his wife down. This feeling on the part of the alcoholic about community attitude is not likely to help him feel or become any more adequate.

There is one last point covered in this study which may be of interest to those community people or agencies hoping to help the alcoholic. This is how the alcoholic feels about the efforts made to keep him from drinking. It is very interesting, and perhaps surprising, that the majority of wives believed that efforts made by others to get the husband to stop drinking were felt by the husbands to be justified. One wife said her husband felt this way "because he likes to feel that people are interested in him, he wants to be respected." Another wife, who believed her husband felt the efforts were unjustified, said that at the time her husband was very unreasonable. "He never liked to drink, but he was easily led. He thought everyone was against him and that no one understood him." The majority of the husbands stated that they felt efforts to get them to stop drinking were unjustified, and they resented them. This was especially true if the efforts were made by the wife. In some cases a man could accept the efforts of outsiders without resentment, while becoming very resentful of his wife's efforts. One client said he resented on the surface the interference of others, but in his "own heart and soul" he knew they were right. Another pointed out that the closer the relationship the more resentful he would feel toward the person trying to influence him to stop drinking. Logically he "could see their point, but it just caused more jitters."

One way in which this particular research work with the alcoholic was possibly unique was that both husbands and wives were involved. In this agency the potential relationship between alcoholism and one of the alcoholic's other problems, marital conflict, was recognized and acted upon. The limited study indicated that the neurotic needs of the wives were involved in the maladaptive drinking behavior of the husbands.*† In agencies in which the focus is upon some other phase of the alcoholic's life, the recognition of a relationship between that specific problem, whatever it might be, and alcoholism might result in help to the alcoholic similar to the help described here.

In the case of married alcoholics, regardless of the presenting problem, a consideration of the interaction between husband and wife may well be a rewarding aspect of the helping process, particularly where the spouse can be actively involved in the efforts being made. Despite differences in his specific problems, the alcoholic must be dealt with in relation to his entire social environment an important part of which are his wife and family.

In summarizing, one point should be made clear about the alcoholic and his search for help in the community. The

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* Ballard, Robert G., and Mudd, Emily H. The Interaction Between Marital Conflict and Alcoholism as Seen Through MMPI's of Marriage Partners. Am. J. Orthopsychiat. (In press.)

† Mitchell, Howard E., and Mudd, Emily H. Interpersonal Perception Theory Applied to Conflicted Marriages in Which Alcoholism Is and Is Not a Problem. Ibid. (In press.)

alcoholic's needs and apprehensions about receiving help with a personal problem are not different in nature from the needs and apprehensions of anyone else; they may, however, be much greater in intensity. Also, his problem almost inevitably is not a single problem but a complex constellation of problems. Thus, if a nonalcoholic with an emotional problem feels anxious and inadequate when he seeks help, the alcoholic by virture of the nature of his illness feels more so. If the nonalcoholic counselee is distrustful of, and afraid of not being accepted by, the counselor the alcoholic is more so. Except for this varying degree in intensity of need, the approach of the "helping" person to the alcoholic does not differ from the desirable approach to anyone else. The alcoholic, especially, will become threatened and will withdraw if he senses rejection.

The essence of the feelings expressed by this particular group of alcoholics and their wives about their attempts to find help in the community indicates in a limited way the direction work with alcoholics must take. Since alcoholism is not a delimited disease entity, but a problem intertangled with many other problems, there can be no one community agency alone whose responsibility or prerogative it is to work with the alcoholic. It is hoped that the experience, as described here, of one agency may suggest to agencies in other communities how they may contribute to the control of the growing and devastating public health problem of alcoholism. Perhaps someday the alcoholic, seeking help, may be assured that in his own community, "He that seeketh shall find."

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Dr. Burton is a member of the research team as one of the counselors working with the clients. Included on the interdisciplinary project team are: Howard E. Mitchell, Ph.D., project director, Emily H. Mudd, Ph.D., director of marriage council of Philadelphia, Inc.

Before the health officer can confidently and firmly take action on problems of radiation in the community, he needs more information. This is particularly the case with regard to ingested radioactivity. This paper presents various facets of the problem of ingested radioactivity and indicates what the Public Health Service is doing to meet some of these needs.

INGESTION OF RADIOACTIVE MATERIALS

James G. Terrill, Jr., F.A.P.H.A.

PUBLIC HEALTH interest in ingested radioactivity must be considered in the light of our knowledge of other radiation exposure, and the effects of the total exposure on man. Human exposure to ionizing radiation results in damage which may or may not be apparent immediately. Therefore, exposure to radiation from all sources must be minimized, and health agencies are obligated to help reduce undue exposure of the population to radiation. Control of sources of ionizing radiation for protection of the public against potential hazards of radiation exposure is a recognized health function for which official health departments must accept major responsibility.

The effect of ionizing radiation on living tissue is to injure or destroy cells. Even the beneficial effects of radiation therapy are an indirect result of injury, for example, the destruction of malignant cells. Moreover, the injurious effects of radiation accumulate as the dose accumulates; each exposure to radiation adds to the total stress the body is called upon to withstand from all causes.

Although the effects of small doses of radiation may be grossly unobservable or slow to appear, for radiation protection purposes it may be assumed that the effects are certain to occur. Once the injury has occurred, there is no known practical means of repairing the damage. Therefore, it is unwise to wait for evidence of radiation damage in the population to justify protective measures.

The cumulative exposure of individuals and the total public exposure to radiation results from various and often unrelated sources. In order to judge the significance of radiation hazards and the control measures that are necessary, over-all identification of sources and evaluation of exposures are essential.

Ingested Radioactivity

Historically, the health professions first became interested in ingested radioactivity when naturally radioactive springs were found and the waters of these were believed to have therapeutic effects if taken in sufficient quantities. The occupational exposure of radium dial painters offered one of the first bases for defining body burden standards. Later, when man-made radioactive materials began to dominate scientific and public thinking as widespread con-

tamination occurred, the need for more detailed knowledge of natural radioactivity was recognized.

A. Natural Radioactivity

As rocks weather away, some radioactivity seeps into the atmosphere, and other naturally occurring radioisotopes find their way in solution to the sea. Thorium quickly combines with constituents of sea water to form insoluble compounds that precipitate onto the ocean floor. Uranium precipitates far more slowly, so that its concentration in sea water reaches the comparatively high value of three parts per billion. Potassium seems to be more concentrated near the bottom; though virtually all of its compounds are soluble, its ions are adsorbed on particles of clay and other ion-exchange materials. This segregation of thorium and potassium lowers the already low concentration of radioisotopes in sea water.

Neither uranium-238 nor thorium-232 nor their decay products enter appreciably into the metabolic processes of living organisms. The radiation that man receives from these elements is thus largely external. However, radium-226 and lead-210, of the uranium series, and radium-228, of the thorium series, can be taken up by plants and thus enter the food chain cycle to man. In the human body radium-226, lead-210, and radium-228 concentrate in bone and thus by themselves contribute about half as much radiation to the skeleton as do all the other decay products of the thorium and uranium series put together. Potassium also enters into biological processes, and distributes itself through the soft tissues. In terms of total energy dissipated potassium contributes most of the natural radiation that originates within the body.

The distribution of carbon-14 which is produced in the atmosphere by cosmic rays depends on its chemical properties, which are considered to be identical with those of stable carbon (carbon-12). Most carbon-14 seems to exist in the form of carbon dioxide; thus it is carried in the turnover of carbon dioxide from the atmosphere into the oceans and through the biosphere.

Since living organisms consist almost entirely of carbon compounds and water, carbon-14 is volumetrically concentrated as it passes through the biosphere. Its internal emissions in human tissues are calculated as about 1 per cent of the background radiation.

Man's utilization of fossil fuels during the past 50 years has been diluting the radioactivity of atmospheric and biological carbon. Because the carborn-14 produced by cosmic rays in coal and oil has long since decayed, the carbon dioxide from the combustion of these substances, amounting to about 15 per cent of the mass of atmospheric carbon dioxide, is nonradioactive and has diluted the carbon-14 content of the atmosphere.

Another cosmic ray product of great scientific interest is hydrogen-3 (tritium). Tritium is formed by a number of processes, most often by the transmutation of atmospheric nitrogen atoms. Only about 20 pounds of natural tritium exist on earth, the bulk of it in the oceans. Combining with oxygen to make water, it reaches the earth as rain or snow. With a half-life of only 12.5 years it does not travel nearly as far as carbon-14 before disintegrating. Water samples from different sources show marked differences in tritium content, depending particularly upon the vast quantity of normal water in the ocean and the relatively high concentration of tritium in atmospheric water.

B. Man-made Radioactivity

The tritium picture has been badly blurred in recent years by the relatively large quantities of the isotope released in the testing of thermonuclear devices. Thermonculear detonations yield tritium as a direct product of the fusion reac-

tion. The total output to date is estimated at 100 pounds, about five times the amount of natural tritium.

Carbon-14 has also been produced at a considerably higher rate over the past seven years than the natural product of cosmic ray neutrons. The man-made carbon-14 now in circulation around the earth is estimated to be about one ton and equals about 1 per cent of the total natural abundance. Most of it is still in the atmosphere compounded in carbon dioxide. In living organisms it is reported to have raised the carbon-14 content as much as 10 per cent above normal.

In addition to strontium-90 and strontium-89 there are three other man-made isotopes, iodine-131, barium-140, and cesium-137 which have recently attracted attention. Barium, like strontium, concentrates in the skeleton; iodine, in the thyroid gland. Because they have short half-lives, radioiodine and radiobarium are at zero levels in nature. Cesium is chemically similar to potassium and tends to be distributed uniformly throughout the body. It has a relatively long half-life (27 years), but decays primarily with the emission of gamma rays. These factors suggest that its principal physiological effects may be related to its contribution to the genetic changes which irradiation may produce. Other fission products, such as radioisotopes of zinc and cobalt, may play a minor role because only minute quantities of these isotopes are likely to reach human beings.

The distribution of strontium-90 and strontium-89, and hence their effects on man, will be discussed in greater detail, since these isotopes are of the greatest scientific and public health interest at the present time.

Status of Guidance Standards on the Significance of Ingested Radioactivity

Most scientific estimates indicate that the radioisotope strontium-90 probably causes the most significant ingested contamination. While strontium-90 will be discussed in the greatest detail, the exposure produced is often accompanied by exposure to strontium-89, and is related to high concentrations of natural radioactive bone seekers in certain areas, and by concurrent exposure to external radiation. As concern over the exposure of the general population to ingested material has increased, the question of applicable standards has become vital. Since standards in public health work have generally been derived from other bases, perhaps a review of this situation is in order.

The need for radiation health standards developed through occupational hazards associated with the use of x-ray machines and radium. Later this was supplemented by the more diverse requirements of the military atomic energy developments and by the industrial applications sponsored by the Atomic Energy Commission. The levels for nonoccupational purposes which are currently being used are adaptations of the levels prescribed for occupational purposes. In recent years many scientific people have raised questions about genetic as well as somatic effects of radiation at low levels over long periods of time. This is the area of particular importance to public health officials. These questions involve the consideration of many factors such as tissue dose, susceptibility of tissues, variation in the distribution of internally deposited substances, the synergistic effects of multiple exposures, variability of effects with age, the existence or nonexistence of threshold phenomena, and many other factors.

During the past year the National Committee on Radiation Protection and Measurements and the International Commission on Radiological Protection have been considering appropriate standards for general population exposure to ingested radioactive materials. As in the

past, the expressed ideas consist of applying factors of conservatism to the standards for occupational exposure. However, during this period the inadequacies of this approach were clearly delineated by the overlap between suggested maximum permissible levels and the levels being found, for example of strontium-90 in milk.

NCRP	(value for planning purposes for people living in the vicinity of atomic energy installations)	100 $\mu\mu$c/l
ICRP	(value for general population for strontium-90 alone)	33 $\mu\mu$c/l
ICRP	(value for general population—adjusted for strontium-89 and short-lived isotope contribution)	~17 $\mu\mu$c/l

While these factors were being discussed the Public Health Service was finding values of 1.4-37.3 $\mu\mu$c/l in its milk surveillance network.

This clearly illustrated that the radiation levels were reaching a point where the simple technic of injecting another factor of conservatism into the standards might adversely affect the public health by interfering with normal nutritional requirements. Thus a new phase of radiation standards development was reached.

The Joint Committee on Atomic Energy conducted very extensive hearings during the spring of 1959, and the question of standards for the general population was considered from many viewpoints. In their summary-analysis of the Hearings on Fallout from Nuclear Weapons Tests the current unsatisfactory situation was recognized in a slightly different way.

"1. Witnesses stressed that in relating published MPC values for water and air to measured concentrations of strontium-90 in food and milk, it is the total intake averaged over some time period such as a year, not the amount in any one sample of food, that determines the significance of the measurement.

"2. The ICRP and NCRP recommendations were derived for guidance and application to the nuclear industry over which close administrative control is exercised in matters of radiation protection and where individual employees voluntarily accept certain risks. Presumably, these recommendations were not designed to cope with continuing uncontrolled environmental sources such as those presented by fallout, over which the individual has no choice or control.

"3. The standards do not (and cannot) set a line which is 'safe' on one side, and 'dangerous' on the other.

"4. Application of the standards requires selective adaptations to allow for the contributions of short-lived material when they are significant, for other sources of radiation, transient exposures in excess of the standards, and other practical matters.

"5. No agreement at all was reached on whether the standards should apply to population averages, to peak values for individuals as they do in occupational exposures, to individual materials, or to average diets.

"It is apparent that very little, if any, progress has been made since 1957 in the development of operational information of this kind involving standards, methods of application, and criteria for decision in the management of environmental radioactivity, including that in food and water supplies. The need for development of such information was noted and documented in the summary analysis of the 1957 hearings."

However, even though there are differences of opinion on the precise level at which significant health effects may be produced, it seems to be the scientific consensus that radiation levels closely corresponding to those often found in the natural background can serve as operating recommendations at the present time for the more significant isotopes. This has led to an increased interest in learning the details of background radiation. At this time it appears that a more specific definition of background is necessary before it can be used effectively in practical standards. In the past, the health officials have made every effort to be as consistent with the National Committee on Radiation Protection and Measurements' recommendations on maximum permissible levels as interpretation of those recommendations and methodology would allow.

Looking to the future, however, it is quite apparent that some very serious thought must be given to the fundamental factors mentioned above and to details such as the units in which the radioactivity will be expressed, i.e., micromicrocuries per liter vis-à-vis micromicrocuries of strontium per gram of calcium, since interpretations, calculations, and laboratory work will be extensively affected by the simple choice of units. The terminology of "maximum permissible" while offering many advantages where occupational exposure is involved, presents many difficulties in interpretation of the health significance of the levels of a mixture of fallout and reactor effluent which will be measured by the public health agencies.

It is our hope that the scientific groups developing standards and providing the research data on which standards are based will give consideration to the establishment of several levels at which health agencies should take appropriate action consistent with risk, rather than to rely entirely upon one level and to define it as maximum permissible.

Thus it seems that health agencies are starting from scratch in terms of acceptable levels of ingested radioactivity for the most susceptible portions of the general population. Exposure and effects data and standardized methods of measuring radioactivity in people and the environment in the critical ranges are all lacking. Many of the current radiation activities of the Public Health Service are directed toward meeting these needs.

Activities of the Public Health Service

A number of activities are under way to determine more precisely the relationship between exposure and effects in specific populations. The uranium miner study is entering the period where clinical findings can be expected to increase. Although this is primarily related to inhaled radioactivity, it may serve as the first check on some of the biological factors used in ingested activity calculations. In the western states some of the waters below uranium mills contain radioactive radium in excess of the current maximum permissible levels. Where these waters can reach people appropriate samples will be taken to determine body burden and possible effects. Pilot studies are being initiated to determine the strontium-90 intake, uptake, and excretion in controlled institutional populations. These can be used to check the estimates on deposition which are currently being used to calculate exposure.

Arrangements are being made to study areas of New York and New England where either rock formations or measurements of natural radioactivity have suggested that statistically significant differences in incidence of congenital malformations or cancer might be found.

It is important that studies of this type be undertaken as rapidly as possible, since observations must be made over a number of years to produce reliable data. While these specific studies are under way every effort will be made to keep up to date on new information related to exposure and effects at the cellular and tissue levels, and with epidemiological studies related to whole body exposure to external radiation.

Research is under way to develop methods of measuring the specific natural and man-made isotopes of significance in water, milk, and food. It is expected that these will take the form of screening as well as quantitative methods. Without screening technics it will be difficult to select samples, and without isotopic measurements interpretation is impossible.

The states and the Public Health Service can use this methodology to create a system of sampling and measurements which will allow all appropriate subdivisions to know the radiological quality

of their environment to the degree required by the public or scientific developments. As a start in this direction the Public Health Service is building two additional radiochemical laboratories at Las Vegas, Nev., and Montgomery, Ala., to supplement the laboratory at Cincinnati. In addition to service functions these laboratories will provide reference and training services for the states. The facilities will allow an enlargement of the current milk sampling program sufficiently so that sampling can be proportional to the milk consumption and thus reflect the radioisotope intake from milk throughout the United States.

While these efforts to increase our knowledge and to gather data are under way, steps are being taken to work through state agencies in areas where radioactivity levels are high to determine appropriate means of reducing contamination. Concurrently, the U. S. Department of Agriculture, the Atomic Energy Commission, and the Public Health Service are planning a project to evaluate the several methods of milk decontamination which scientists have suggested.

Summary

Current levels of ingested radioactivity require more precise information on effects, methods of measurement, and data on total exposure before the health officer can firmly reassure the public or confidently undertake control actions. The Public Health Service is attempting to meet some of these needs.

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This paper was presented before a Joint Session of the Conference of Municipal Public Health Engineers, the Engineering and Sanitation and Health Officers Sections of the American Public Health Association at the Eighty-Seventh Annual Meeting in Atlantic City, N. J., October 20, 1959.

Journals Wanted

If there are any readers who have no further need of their March, 1960, Journals, the Association would be grateful if members would mail them to the Association at 1790 Broadway, New York 19, N. Y.

The use of a telephone answering device by a large city health department is described in this report. It is a useful method of providing certain kinds of health information and can undoubtedly be used in a variety of localities.

THE RECORDED TELEPHONE MESSAGE AS A PUBLIC HEALTH EDUCATION DEVICE

George M. Uhl, M.D., M.S.P.H., F.A.P.H.A., and David E. Janison, M.P.H.

MORE THAN THREE YEARS have elapsed since the Los Angeles City Health Department installed a telephonic device that automatically answers incoming calls with a recording. It was originally intended to announce daily locations of polio immunization clinics. It has proved invaluable in other public health programs.

In 1957 the City of Los Angeles shared in a California appropriation for a state-wide polio immunization project to the extent of 630,000 inoculations locally. A schedule was developed in clinics of the department's 16 district health centers, in public parks, and other places. From 3 to 16 clinics were scheduled daily at varying locations. An intensive community organization and public information program were undertaken. Immediate public response was felt. The flood of incoming telephone calls incapacitated normal health department business. Available automatic, 24-hour telephone answering devices were explored and a suitable model ordered.

A separate telephone line and a new number (which did not go through the City Hall switchboard, already overloaded with polio calls), were obtained.

Installation of the telephones was completed late one afternoon. An announcement to this effect was made to radio, press, and television. The response was immediate. To handle the volume, the original two instruments were increased to three, then four, then five. Clerks, switchboard operators, and other personnel receiving requests for immunization schedules were instructed to inform callers about the existence of the new special number. There was an immediate drop in telephone calls received by various health department offices regarding the polio schedule; eventually there were virtually no calls, the automatic instruments handling them all.

The message on the "2A" model of the automatic device lasts about 53 seconds. It is recorded on a tape-like cylinder inside a box-like device on which the telephone itself sits. The recording can be made by any member of the staff by simply turning a dial to "record," speaking the message, checking it afterward on "check," and then setting it for its business by turning the dial to "answer." A new recording wipes out the previous one. If desired, the answering device can be

turned off completely and the telephone answered by a human operator; this occasionally becomes necessary when the instrument breaks down from heavy use.

When the polio clinics were finished, the telephone message was used for other subjects: advice to users of unvented gas heaters, location of dog vaccination clinics, features of the health department's services, and, when necessary, for emergencies, several of which developed during the first year's telephone service. One was the false announcement that Los Angeles had been subjected to a radioactive fallout "eight times heavier than the safe limit." An avalanche of frantic telephone calls came into health department offices; a reassuring message that current fallout was below the danger level, that milk, water, and food supplies were safe, and that children could play outdoors, was put on the automatic telephones. Switchboard operators were advised of this. After a few hours of heavy service, the telephones subsided, as did the dangerous rumor.

On April 1, 1958, this message on VD was recorded:

> This is a recording. Venereal diseases are increasing in Los Angeles. Many persons are not aware of their condition. Remember these facts. VD is spread mainly by sexual intercourse and kissing. Symptoms include sores, rashes, and discharges. Treatment by a capable physician must begin immediately. These diseases can be cured. If not treated, they can cause crippling, sterility, even death. If you have no family doctor, call the County Medical Association, DUnkirk 5-1581, or the County Osteopathic Association, NOrmandy 5-5766, for the names of qualified physicians near you. If you cannot see a private doctor, call your nearest city or county health center. Don't delay. This is the end of the record.

Only one local newspaper reported that this message was on the special telephones. From the beginning the results were heavy. A count placed the number of incoming calls at 5,000 a day, continuing unabated for 37 days, the length of time the recording was run. Five separate breakdowns occurred in the equipment, necessitating quick repairs. As a result of the message, an average of 70 persons daily telephoned the Osteopathic and Medical Associations for the names of local physicians who treated VD. One city health department VD clinic reported a 22 per cent increase in gonorrhea attendance; all other VD clinics in the health department system reported some increase.

Many of the callers for the VD message were given the number as a prank by friends. Nevertheless, more than 180,000 calls were received. A slight rise was noted in over-all VD reporting. The special number became better known to city residents. A national news magazine devoted an article to it in its "medicine" section. Meanwhile, reliable informants reported that the line was giving a busy signal at all hours of the night, with the longest waiting time occuring during the weekends and from midnight to 2 a.m.

The VD message, which is hardly different from that appearing in pamphlets and other printed material, drew its large response not only because of general interest in the subject, but also because it was a novel auditory sensation, something akin to the peep show, with an outlet in each home or office. The department recognized that the message would serve as a joke to many, but the concrete results of increased VD findings and interest turned the humor to good advantage.

Costs for each telephone instrument are roughly $35 for installation and $17 monthly rental and line charges. These prices may vary in other localities and for other instruments.

Summary

A health education use for an automatic 24-hour telephone answering device is described. Inexpensive, it can

handle thousands of calls a day, providing a personal response. It can be easily changed, and is adaptable to emergency situations. Its greatest response is when its message is on subjects of greatest personal interest, such as polio clinic locations, or a message on VD. In Los Angeles such a telephone has become an integral tool of the health department.

Dr. Uhl is health officer and Mr. Janison is director of health education, City Health Department, Los Angeles, Calif.

Beryllium Poisoning

"The metal, beryllium, is of great importance in building and operating atomic reactors. It seems likely that metallurgists will succeed in making it ductile and workable, which will greatly extend its use as it is the lightest metal known. Our first toxic troubles from beryllium came from fluorescent lamp manufacture where a complex beryllium silicate was used as a phosphor lining for the fluorescent tubes. Acute poisonings occurred and soon a number of chronic poisonings, many of which were of long duration and fatal. All of them, acute and chronic, probably resulted from breathing beryllium compounds sometimes in concentrations ordinarily considered as 'trace amounts.' . . . The precautionary measures now being applied in the processing of beryllium are comparable in severity to those used in handling very toxic gases or radioactive materials. There are still poisonings from exposures of some years ago, but it is felt that control is at last becoming effective, while advances in the medical management of Be poisonings have been very great."

Drinker, P. Industrial Hygiene and Air Pollution. The Royal Society for the Promotion of Health Journal (July-Aug.), 1959.

Information on the characteristics and needs of the aged mentally ill is deficient. This situation hinders a clear and consistent definition of the problem and, in consequence, efforts to find a solution. The authors of this study have endeavored to supply such information on first admissions to state public mental hospitals in Ohio.

MENTAL DISEASES OF THE SENIUM AT MID-CENTURY: FIRST ADMISSIONS TO OHIO STATE PUBLIC MENTAL HOSPITALS

Ben Z. Locke, M.S., F.A.P.H.A.; Morton Kramer, Sc.D., F.A.P.H.A.; and Benjamin Pasamanick, M.D., F.A.P.H.A.

THE DISPROPORTIONATELY large number of first admissions to public mental hospitals arising from the population 65 years of age and over is a matter of much concern to public health, mental hospital, and welfare officials throughout the nation. The reasons for this concern are several. First, the population in the age group 65 and over has been increasing rapidly; and it is anticipated that by 1980 the population in this age group will be 50 per cent more than it is now.[1] Therefore, even if admission rates stay at current levels, there will be a considerable increase in the number of persons in this age group admitted to mental hospitals. Second, patients in this age group constitute a special problem for hospital staffs, since they require a great deal of physical and medical care and account to a large extent for the high mortality rate in the mental hospitals.

To assist in the solution of this problem considerably more knowledge is needed on the aging process; the etiology of mental illness in the older population; the social, economic, and cultural factors that lead to various patterns of care for those who become ill; and, in particular, the factors that lead to the admissions of these people to the mental hospital as opposed to other community facilities.

Although data are available to show the trend of first admission rates for the nation and for the various states,[2] there is a paucity of current data on the variations of these rates by such factors as race, marital status, education, urban-rural residence, occupation, etc. The most extensive studies of these rates by such factors were those done by Dayton for first admissions to mental hospitals in the years 1917-1933 in the State of Massachusetts[3] and by Malzberg for first admissions to the New York State Civil Hospital for the years 1929-1931 and 1939-1941.[4,5,6]

Recently, an extensive analysis has been carried out, on first admissions to the state public mental hospitals in Ohio, which yielded certain data on the variations and the rates of admissions to these hospitals for patients with mental

diseases of the senium by a variety of demographic characteristics. Because of the importance of this particular problem, it was thought worth-while to present these findings, to discuss the problems of their interpretation, and to suggest some solutions. These findings will be of additional use when compared to results of studies of admissions to mental facilities which are related to the forthcoming 1960 census.

Data and Method

This study considered the 26,645 first admissions to the Ohio state mental hospitals during the four and one-half year period, January 1, 1948, through June 30, 1952, with particular emphasis on the 5,676 admissions diagnosed as mental diseases of the senium. Each admission was classified by age at last birthday, sex, marital status, color, residence, education, employment, and occupation.

The definitions of the socioeconomic variables for which rates were computed were identical to those used in the corresponding Census Bureau classifications in the "Census of Population," and steps were taken at the Ohio Department of Mental Hygiene and Correction to see that these definitions were used by the admitting staff. The diagnosis placed on each case was according to the classifications included in the eighth edition of the "Statistical Manual" published in 1934.

The population data used as the base for rate computations were those published by the Bureau of the Census for the State of Ohio as of April 1, 1950.[7] So as to provide an adequate and reasonably stable number of cases for the numerator of the rates, the first admissions during the four and one-half year period were averaged. Thus, the rates presented are the average annual rates per 100,000 population during the four and one-half year period, January 1, 1948-June 30, 1952, specific for the variables in question. Whenever practical, age-adjusted rates were also computed.

This analysis is concerned particularly with variations in the first admission rates for mental diseases of the senium to the Ohio state mental hospitals according to certain basic characteristics of the counties of which the defined group of patients were considered residents by the admitting authorities. The 88 counties of Ohio were classified on two major axes: (1) as to whether they were metropolitan or nonmetropolitan in accordance with Census Bureau definitions;* and (2) as to whether they were counties with high or low rates of state mental hospital usage.

The metropolitan, nonmetropolitan classification was used, so that it would be possible to "discriminate adequately between the population living in, and served by the facilities of, large urban centers, and the population of more isolated areas."[8] This classification provides a more adequate measure of urbanization than the urban-rural classification, wherein urban is defined as any incorporated place of 2,500 inhabitants or more.

The counties were also divided into areas of high and low mental hospital usage, so that it would be possible to examine the socioeconomic characteristics of such areas in order to investigate patterns of hospitalization for persons with different disorders. The metropolitan counties with average rates of first admissions for all diagnoses lower than the corresponding median rate for all such counties were considered counties

* A standard metropolitan area is a county or group of contiguous counties which contains at least one city of 50,000 inhabitants or more. In addition to the county, or counties, containing such a city, or cities, contiguous counties are included in a standard metropolitan area if according to certain criteria they are essentially metropolitan in character and socially and economically integrated with the central city.

with low rates of hospital usage, while those above the median were considered as high-rate counties. A similar procedure was followed for the nonmetropolitan counties using the total median rate for these counties as the dividing point. The median admission rate for all mental disorders was used in order to provide a basic geographic frame of reference within which the major mental disorders could be analyzed and compared. No major modification in the findings would have been necessary had mental diseases of the senium rates been used to obtain the geographic groupings.

There resulted the following four major groupings of counties to be designated A, B, C, and D as follows:

Geographic Grouping	No. of Counties	Population as of April 1, 1950	
		Total	45 and Over
A = Metropolitan, high state hospital first admission rates	8	2,192,966	648,889
B = Metropolitan, low state hospital first admission rates	9	3,142,005	937,275
C = Nonmetropolitan, high state hospital first admission rates	35	1,347,220	418,743
D = Nonmetropolitan, low state hospital first admission rates	36	1,264,436	384,488
Total	88	7,946,627	2,389,395

Findings

Residence and Facilities

The first admission rates for mental diseases of the senium in the metropolitan and nonmetropolitan counties in the classifications described above were as follows:

Geographic Area	Average Annual		
	Number of First Admissions	Rate per 100,000 Population	
		Crude	Age Adjusted*
Metropolitan total	913	57.7	64.1
High-rate area: A	401	62.2	70.2
Low-rate area: B	512	54.6	60.0
Nonmetropolitan total	347	43.2	37.3
High-rate area: C	228	54.4	46.9
Low-rate area: D	119	31.0	27.1

* These rates were adjusted on the basis of the population of the State of Ohio in 1950 in the age group 45 years and over.

The metropolitan rate was substantially higher than the nonmetropolitan rate. These findings are consistent with those reported by Malzberg[4] and Bellin.[9]

Wanklin postulated that since patients from rural areas were admitted during the terminal phase of their illness, the urban rate exceeded the rural rate because of the tendency in the latter area to care for patients at home until advanced symptoms made this no longer feasible.[10] This hypothesis can and should be tested.

That considerable variation exists, however, regardless of urbanization per se was evidenced in an examination of all 88 counties in Ohio. The distribution of these 88 counties by admission rates did not show a greater proportion of the metropolitan counties above the

median rate than expected.* Indeed, for some of the variables analyzed and presented in this report, the nonmetropolitan rate exceeded the metropolitan rate. Malzberg and Bellin had also reported wide variations in the geographic admission rates.[4,9]

Table 1 presents a summary of certain population characteristics for the metropolitan and nonmetropolitan counties.[7] Most of these characteristics are consistent with the higher rates observed for the metropolitan area; but there are some exceptions, such as the lower median income and lower level of education among the residents of the nonmetropolitan area. What is difficult to explain from these data are the differences in admission rates between area A and B or between C and D since their population characteristics are very much alike.

A factor which warrants consideration in seeking explanations for the differences of rates of admission from these four areas is the utilization of facilities for the care and treatment of persons with mental diseases of the senium other

* Chi-square with Yates correction = 2.62, $P > 0.10$.

Table 1—Summary of Specified Population Characteristics for Ohio Metropolitan and Nonmetropolitan Places: 1950

Characteristic	Metropolitan		Nonmetropolitan	
	A	B	C	D
Mental diseases of the senium age adjusted average annual first admission rate (45 years and over)	70.2	60.0	46.9	27.1
Population per square mile	569.30	535.41	80.92	75.33
Median income (in dollars)	3,232	3,258	2,452	2,469
Per cent with income under $2,000	25.4	27.0	40.3	39.7
Per cent laborers are of employed (male)	8.7	7.5	8.7	7.1
Median school year completed	10.1	10.2	9.0	9.5
Median age	31.2	31.9	30.7	30.2
Per cent 65+	8.0	8.1	10.8	10.6
Per cent nonwhite	7.1	10.1	1.5	2.0
Per cent foreign-born	9.4	11.4	3.9	2.2
Per cent foreign-born (naturalized)	83.8	83.5	79.9	78.5
Per cent urban population	80.0	88.7	42.5	36.7
Per cent rural nonfarm population	15.8	8.7	32.7	35.9
Per cent rural farm population	4.2	2.6	24.9	27.4
Per cent of occupied dwelling units that are owner occupied	63.6	54.2	68.4	66.1
Per cent increase in population 1940–1950:				
Total	17.0	19.8	6.3	10.4
Male white	13.6	15.4	4.4	8.3
Male nonwhite	49.8	58.7	14.5	11.7
Female white	16.5	17.4	8.0	12.5
Female nonwhite	51.8	60.7	17.3	14.8
Of those aged 45 and over				
Per cent married	69.2	67.6	69.8	
Per cent single, divorced, and separated	12.5	13.0	11.4	
Per cent widowed	18.3	19.4	18.9	

Table 2—Mental Diseases of the Senium Average Annual Age-Adjusted First Admission Rates per 100,000, Ratio of Population to Beds for the State Hospital System, Number of Facilities and Beds by Specified Hospital Category by Residence, Ohio, 1950

Residence	Population*	Rate*	State Hospital System		Ratio of Population to Beds in State Hospitals*	Private Mental Hospitals		VA Hospitals or Psychiatric Facilities†		General Hospitals with Psychiatric Facilities‡		Facilities for the Aged§	Outpatient Psychiatric Clinics
			No.	Beds		No.	Beds	No.	Beds	No.	Beds	Beds	
Met. A	648,889	70.2	6	9,826	66.0	3	125¶	0	0	4	25¶	5,218	7
Met. B	937,275	60.0	5	9,498	98.7	5	423	2	290	6	224	8,782	16
N. Met. C	418,743	46.9	4	6,035	69.4	0	0	0	0	0	0	4,072	0
N. Met. D	384,488	27.1	1	580	662.9	0	0	1	2,155	1	10	3,298	1

* Based on the population 45 years of age and over according to the 1950 Ohio Census. If the population 15 and over were used, the ratios would be (A) 166.8, (B) 249.4, (C) 161.5, (D) 1,369.6.

† Veterans Administration Statistical Summary—Office of Chief, Medical Director, January 31, 1951.

‡ The data for general hospitals with psychiatric facilities were obtained from the 1934 report schedules sent to the Biometrics Branch, National Institute of Mental Health.

§ Nursing homes, proprietary homes, nonprofit homes for the aged and infirm.

¶ No information on the number of beds in the Twin Maples Sanitarium was available.

‖ Data for White Cross Hospital and the Ohio Penitentiary were unavailable.

Source for number of beds: Hospitals—Statistics and Directory Issue, J. Am. Hosp. A., Part II, 1951.
Homes for the aged—Division of Social Administration, Ohio Department of Public Welfare.

than the state mental hospitals. In Ohio, for example, a larger number of facilities other than state facilities are available in area B and probably in area D, the areas with lower admission rates than A and C (Table 2). It may be that such facilities funnel off some patients who otherwise would be admitted to the state facilities.

An analysis was made by relating first admission rates for mental diseases of the senium to the presence or absence of hospital facilities for the care of the mentally ill in five groupings of the 88 counties of Ohio as follows:

Area Grouping	No. of Counties	Definition
I	5	Counties with a state mental hospital and one or more of the following facilities: Veterans Administration hospital; general hospital with psychiatric facilities; private mental hospital
II	9	Counties with a state mental hospital, but none of the other above listed facilities
III	2	Counties without a state mental hospital, but with one or more of the facilities listed above for area I
IV	43	Counties without a state mental hospital, but with substantial common borders with counties in either Group I or II, that is, with counties having a state mental hospital
V	29	All other counties

Of interest is the observation that in the metropolitan area, the rates of admission for the counties with state and other facilities (areas I and II) are not strikingly different from those in the counties with no facilities (areas IV and V, Table 3). This is not so for the nonmetropolitan areas. Indeed, the highest rate of admission is from the nonmetropolitan counties in area II, but it

is based on a relatively small population. For the areas with no facilities (areas IV and V), the metropolitan admission rates exceed the nonmetropolitan rates. However, this analysis is inconclusive with respect to the effect of other facilities on the rates of admission to the state hospitals for patients with mental diseases of the senium since it could not consider the role played by the more than 20,000 beds in homes for the aged (Table 2) in providing care for such patients. This deficiency will be considered below in the discussion of the findings.

Age, Sex, and Color

Mental diseases of the senium constituted 60 per cent of all admissions in the age group 55 and over. Among metropolitan or nonmetropolitan residents, males or females, white or nonwhite, the admission rate rose rapidly with advancing age.

The admission rate for males, white or nonwhite, was higher than the female rate, the difference being greater in the nonmetropolitan area (Table 4, Figure 1, and Appendix Table 1). Adjustment for age did not alter this observation. In fact, age-adjusted rates for 1930 and 1940 also showed male rates to be higher than female rates, but in 1940 the difference was not as marked.

There are many reasonable hypotheses regarding the observation that the admission rate for males was higher than that for females. These hypotheses relate to the role of biologic, psychologic, sociologic, and economic variables, among others, in producing the observed differences. The observation is in keeping, for example, with the fact that males generally have higher rates of morbidity and mortality. What, however, is the psychologic and economic impact on a family in the forced retirement of its elder male members? Even when the economic factor is minimized there are unanswered questions concerning interpersonal relations and the acceptance of new roles. Knowledge is needed concerning an aging process in a social setting in which women are accustomed to being home and where adjustments are almost imperceptibly made by the family as her ability to function decreases, yet no such gradualism in adjustment prevails to protect the ex-breadwinner. Indeed, it

Table 3—Average Annual First Admission Rates* per 100,000 to Ohio Public Mental Hospitals by Residence and Facilities,† 1948–June 30, 1952: Mental Diseases of the Senium

Residence and Facilities	Population			Average Annual First Admissions					
				Number			Rate		
	Total	Metropolitan	Nonmetropolitan	Total	Met.	Nonmet.	Total	Met.	Nonmet.
I	997,056	997,056	—	564	564	—	56.6	56.6	—
II	419,508	346,072	73,436	263	201	62	62.7	58.1	84.4
III	48,294	32,646	15,648	16	13	3	33.1	39.8	19.2
IV	600,596	162,968	437,628	288	107	181	48.0	65.7	41.4
V	323,941	47,422	276,519	131	28	103	40.4	59.0	37.2

* Population and rates based on ages 45 and over.

† Definition of Residence and Facilities:

I—Counties having a state hospital and any one of the following facilities: Veterans Administration hospital, general hospital with psychiatric facilities, private mental hospitals.

II—Counties having a state hospital not in Group I.

III—Counties having a VA hospital, general hospital with psychiatric facilities, or private mental hospital not in Groups I or II (no state mental hospital).

IV—Counties with substantial common borders to counties in Groups I and II (i.e., counties with state mental hospitals with or without other mental facilities).

V—All other counties.

Table 4—Average Annual First Admission Rates per 100,000 to Ohio Public Mental Hospitals by Age, Sex, Color, and Residence; Ratio of Male to Female Rates, 1948–June 30, 1952: Mental Diseases of the Senium

Age	Total						White						Nonwhite		
	Metropolitan			Nonmetropolitan			Metropolitan			Nonmetropolitan			Metropolitan		
	Total	A	B	Total	C	D	Total	A	B	Total	C	D	Total	A	B
Male															
Total*	62.8	69.5	57.9	54.6	69.3	38.7	59.6	67.9	53.5	54.4	69.4	38.1	101.8	94.1	105.9
Adjusted	73.0	80.5	68.0	48.0	61.0	34.5	68.4	77.6	61.6	48.0	61.0	34.0	151.1	131.3	161.7
45–54	3.5	(3.5)	(3.4)	(2.0)	(2.7)	(1.3)	(2.9)	(2.7)	(3.0)	(2.1)	(2.8)	(1.3)	(8.8)	(12.7)	(6.7)
55–64	31.0	35.3	27.9	26.3	29.2	23.0	27.0	31.9	23.5	26.1	29.0	23.1	85.7	(93.0)	(81.9)
65–74	140.2	151.5	132.1	91.7	113.3	67.9	130.0	144.8	119.2	90.5	112.3	66.3	306.8	(284.6)	318.8
75–84	336.2	378.6	312.1	214.3	287.8	135.7	330.1	379.6	293.2	214.5	289.8	133.4	541.3	(356.2)	(639.5)
85+	436.4	466.3	414.6	213.2	313.0	(144.3)	401.1	451.7	363.5	231.7	317.8	(140.0)	(1,040.0)	(761.0)	(1,196.6)
Female															
Total*	52.5	54.0	51.5	32.1	39.9	23.5	50.3	52.5	48.8	31.7	39.9	22.7	82.4	80.1	83.5
Adjusted	54.2	55.7	53.3	27.2	33.7	20.0	51.0	53.3	49.5	26.8	25.5	19.3	108.5	101.8	111.7
45–54	3.3	(3.6)	(3.1)	(1.0)	(0.9)	(1.0)	(2.1)	(2.0)	(2.2)	(1.0)	(0.9)	(1.0)	(15.7)	(24.4)	(11.6)
55–64	22.8	24.3	21.8	14.5	18.1	(10.4)	20.0	22.6	18.2	14.1	18.4	(9.4)	67.7	(59.9)	(71.4)
65–74	101.3	108.1	96.8	57.4	67.8	45.9	95.0	103.5	89.1	56.6	67.1	44.9	212.3	(206.3)	215.3
75–84	255.8	259.1	253.6	108.8	138.4	77.4	249.2	255.2	245.7	108.0	38.6	75.1	401.3	(373.0)	(415.1)
85+	317.2	261.5	355.7	125.4	(189.6)	(58.6)	312.9	267.9	344.6	124.3	(191.7)	(54.0)	(394.9)	(112.0)	(527.8)
Ratio of Male to Female															
Total*	1.2	1.3	1.1	1.7	1.7	1.6	1.2	1.3	1.1	1.7	1.7	1.7	1.2	1.2	1.3
Adjusted	1.3	1.4	1.3	1.8	1.8	1.7	1.3	1.5	1.2	1.8	2.4	1.8	1.4	1.3	1.4
45–54	1.1	(1.0)	(1.1)	(2.0)	(3.0)	(1.3)	(1.4)	(1.4)	(1.4)	(2.1)	(3.1)	(1.3)	(.6)	(.5)	(.6)
55–64	1.4	1.5	1.3	1.8	1.6	(2.2)	1.4	1.4	1.3	1.9	1.6	(2.5)	1.3	(1.6)	(1.1)
65–74	1.4	1.4	1.4	1.6	1.7	1.5	1.4	1.4	1.3	1.6	1.7	1.5	1.4	(1.4)	1.5
75–84	1.3	1.5	1.2	2.0	2.1	1.8	1.3	1.5	1.2	2.0	2.1	1.8	1.3	(1.0)	(1.5)
85+	1.4	1.8	1.2	1.7	(1.6)	(2.5)	1.3	1.7	1.1	1.9	(1.7)	(2.6)	(2.6)	(6.8)	(2.3)

* Total rates, crude and adjusted, are based on 1950 Ohio population 45 and over.
( ) = Rate based on an average of less than 10 admissions a year.

is possible that "the general inactivity our society has forced upon individuals deemed unproductive and unprofitable also seems to play a role" in the appearance of disabling psychologic signs and symptoms.[11]

The crude admission rate showed that for either sex the nonwhite rate was somewhat higher than the rate for whites. The age-adjusted rates emphasize the extent of the discrepancy, the rate for nonwhites being more than twice that for whites (Table 4). In his study of admissions, Malzberg also observed the higher rate among nonwhites as compared to whites.[6]

It is of interest to note that for nonwhites, male or female, area B actually had a higher rate than did area A (Table 4). Among whites the reverse was observed, as expected, since by definition area A represents those counties having high state mental hospital usage and B those counties with low hospital usage. Similar differences had been observed in a study involving schizophrenic admissions.[12] It was then hypothesized that the observed difference may be due to differential utilization of existing facilities by members of the different races which may occur in several ways. For example, there may be a lack of facilities for the care of the nonwhite mentally ill other than in public hospitals; or there may be a greater tendency, for whatever the reasons, for public mental hospitals to be used for or by the nonwhite population than the white.

Just as the differences in admission rates between sexes may be related to biologic factors, so too could such factors play a part in differences in admission rates between races. A more likely explanation is that the nonwhite household composition and economic conditions are such that it precludes retention

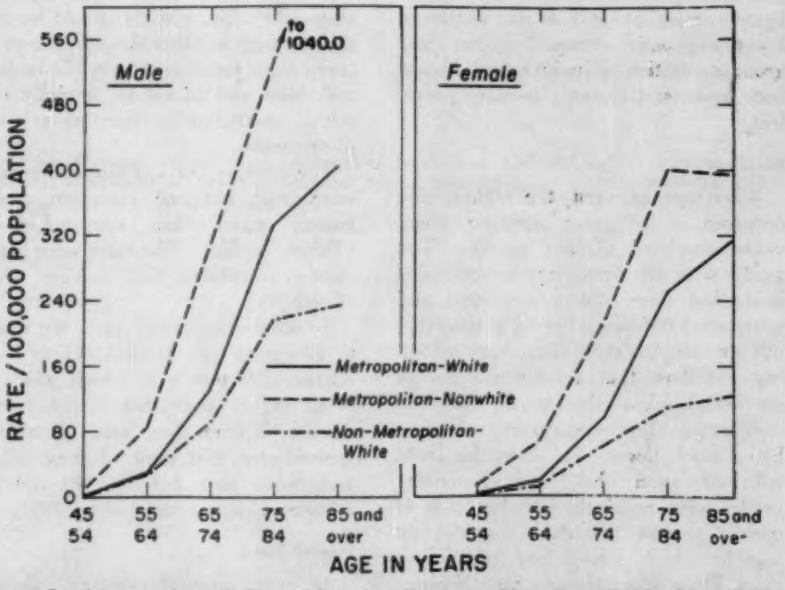

Figure 1—Average Annual First Admission Rates to Ohio State Public Mental Hospitals by Age, Sex, Color, and Residence, 1948–June 30, 1952: Mental Diseases of the Senium

Table 5a—Age-Adjusted* Average Annual First Admission Rates per 100,000 to Ohio Public Mental Hospitals by Residence, Sex, and Years of School Completed, 1948–June 30, 1952: Mental Diseases of the Senium

Years of School Completed	Metropolitan						Nonmetropolitan	
	Male			Female				
	Total	A	B	Total	A	B	Male	Female
Total	60.9	70.5	54.0	46.7	52.2	43.1	44.3	25.4
None	114.6	141.1	92.3	77.2	96.7	64.7	93.0	35.4
Elementary	68.7	80.5	60.2	53.1	57.7	50.2	48.5	27.5
1–7 years	28.3	33.6	22.4	19.9	19.7	20.1	25.4	10.1
8 years	129.3	140.4	117.8	92.1	94.6	89.7	69.4	39.1
High School	37.5	41.4	34.7	29.8	38.3	23.7	28.5	18.9
1–3 years	19.3	24.3	14.3	14.8	18.5	11.0	22.5	11.1
4 years	56.0	59.4	52.5	43.8	54.0	33.6	35.6	30.1
College	30.3	29.6	30.8	21.8	24.7	19.7	30.1	21.1

* Based on 1950 Ohio population aged 45 years and over.

at home. For example, a study of prevalence of noninstitutionalized psychoses in an urban community revealed the rate among whites to be 19 times that for nonwhites.[13] Nevertheless, additional factors, socioeconomically related, may lead to an intensified risk of breakdown in nonwhites as well as in whites in lower economic strata, for in these groups nutrition is poorer and illness, both acute and chronic, is more prevalent.

Education

When age adjusted, the highest rate occurred in the group with no school years completed (Tables 5a, 5b). The group with an elementary education is next; but there was a consistent and substantial difference between those that did not complete their elementary schooling and those that did but did not go on to high school, the rate for those not completing their elementary schooling being much lower. The rates for those with education above the elementary grades were relatively low, but it is of interest to note that those that did not complete high school had the lowest rates. These aberrations in rates between those completing a level of education and those not completing it were probably affected by the inclination of people reporting education to "round off," so that more people were credited with completion of high school or elementary school than should have been. While it seems warranted to state that senium admission rates were lower among those with more education, a study should be done to determine whether the differences between those finishing a level of education and those who do not are actually a result of an artifact in reporting or a true phenomenon.

The rates by years of school completed were, with but one exception, higher among males than among females (Tables 5a, 5b). The rates were higher among nonwhites than among whites (Table 5b).

To what extent these rates are related to education per se and not to socioeconomic factors with which education is so highly associated is not readily discernible from these data. It must be remembered that most of these admissions were born before 1890 and had completed their education by 1915.

Marital Status

In every marital category, the age-adjusted rates for males exceed by a considerable amount the female rates,

Table 5b—Average Annual First Admission Rates per 100,000 from Four Metropolitan Counties* to Ohio Public Mental Hospitals by Sex, Color, and Years of School Completed, 1948–June 30, 1952: Mental Diseases of the Senium

Years of School Completed	Male		Female	
	White	Nonwhite	White	Nonwhite
None	96.4	269.4	76.9	127.7
Elementary	60.9	80.4	58.6	75.9
High School	17.8	35.5	19.4	28.0

* Based on population 45 years and over for four metropolitan counties: Hamilton, Cuyahoga, Lake, and Franklin.

and the metropolitan rates exceed the nonmetropolitan rates (Table 6 and Figure 2).

The rates of admission were highest for the divorced and separated group, followed by the single and widowed groups. The married had the lowest admission rates (Table 6 and Figure 2). The substantially lower rates of the married group may well reflect the resources of this group in terms of more readily available financial and physical care. From the available data the importance of isolation could not be determined. A study of Gruenberg had shown higher percentages of admissions among people living alone.[14] However, a study of a noninstitutional population of persons aged 65 and over revealed that while "on a gross basis, the mental disorder rates for the widowed are significantly higher than those of the married," the data did not confirm the gross findings when controlled for such factors as physical health, socioeconomic status, and age.[15] Undoubtedly, additional studies are needed to determine the importance of marital status and/or isolation as factors in hospitalization.

Employed or Keeping House

Census data for the employed and keeping house groups by age and sex were available only for the standard metropolitan areas. Data presented in Table 4 had shown area A, as expected, to have higher admission rates than area B, yet admission rates among the employed for either sex were higher in

Table 6—Average Annual First Admission Rates per 100,000 to Ohio State Public Mental Hospitals by Age, Sex, Marital Status, and Residence, 1948–June 30, 1952: Mental Diseases of the Senium

Age	Male				Female			
	Single	Married	Widowed	Divorced and Separated	Single	Married	Widowed	Divorced and Separated
				Metropolitan				
Total*	200.1	87.6	148.9	304.7	105.5	67.5	92.7	224.5
55–64	80.6	20.5	59.9	79.5	22.2	18.1	30.5	48.6
65–74	268.8	101.5	178.8	371.0	125.4	72.2	115.2	208.1
75+	449.3	279.4	379.0	906.1	337.5	219.9	250.1	837.4
				Nonmetropolitan				
Total*	128.2	63.3	97.0	225.8	66.0	36.8	51.3	78.9
55–64	68.3	17.0	45.8	109.5	21.9	8.9	29.7	25.9
65–74	166.3	75.9	110.2	198.4	74.7	47.2	61.1	131.0
75+	245.6	188.9	237.5	665.7	192.5	106.6	101.8	144.3

* Age-adjusted based on 1950 Ohio population aged 55 years and over.

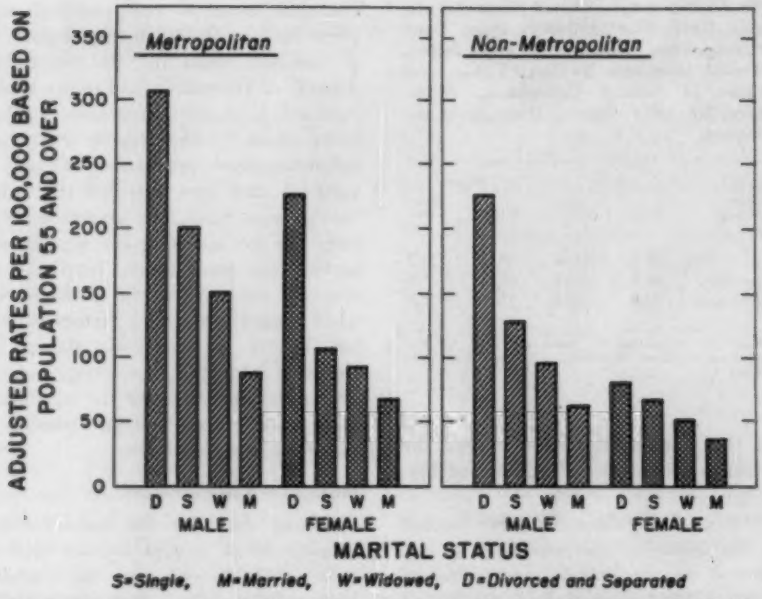

Figure 2—Average Annual Adjusted First Admission Rates to Ohio State Public Mental Hospitals by Sex, Residence, and Marital Status, 1948–June 30, 1952: Mental Diseases of the Senium

the B area (Table 7a). It is interesting that the nonwhites in metropolitan B also exhibited a higher rate than nonwhites in metropolitan A (see Table 4 and section on age, sex, and color).

As a group, the employed males had a higher admission rate than did employed females (Table 7a). However, among the white population in several metropolitan counties for which census data was available by age, sex, race, and occupation, both sexes had similar rates (Table 7b).

When adjusted for age, the employed females had a much higher admission rate than did those keeping house (Tables 7a, 7b). These higher rates among employed females are probably associated with the fact that they are less likely to be married and more likely to be in a lower economic group than those who are at home. Note that in the 45-64 age group the rates for the employed and the keeping house groups are about the same.

The age-adjusted rates among employed males and females, or females keeping house were about three times as high for nonwhites as for the whites (Table 7b).

Occupation

An analysis of the male first admissions by major occupational groups showed that while four out of the ten groups constituted 44 per cent of the general working population they contributed 75 per cent of the admissions. These four occupational groups were farmers (including farm managers and farm laborers), laborers (except farm and mine), service workers (except private household), and craftsmen (including foremen and kindred workers).

Those with the occupational classification of laborers had the highest rate of admission among males aged 55 and over (Table 8). The metropolitan rate was slightly higher than the nonmetropolitan rate, but the rate for nonmetropolitan laborers was higher than the rates for any other occupation regardless of residence.

It is also of interest to note that for six of the nine specific occupational groups, the nonmetropolitan rate is greater than its metropolitan equivalent. However, these rates are unadjusted for age. Thus, if a greater proportion of the nonmetropolitan employed are in the older ages as compared to those so engaged in the metropolitan area, the crude rates may reflect a difference in age composition rather than an actual difference in rates. If retirement, induced or otherwise, is more prevalent in metropolitan areas, it is very likely that these occupational rates would be altered by an age adjustment and the disparity between the two areas diminished.

Discussion and Summary

The aged population is increasing.[1,16] In 1900, five per cent of the population was over 65 years of age; in 1960 it will be about 10 per cent. By 1980, if there were no changes in admission rates to the public mental hospitals of Ohio, the number of admissions in the 45 and over age group admitted during the year with a diagnosis of mental disease of the senium (senile psychoses or cerebral arteriosclerosis with psychosis) would number 1,488, i.e., 575 persons or 63 per cent more than the 913 admitted in 1950. An important question to be resolved is to what extent will the population increase among the aged actually be reflected by an increase among admissions to mental hospitals.

This study showed that first admission rates to the Ohio state mental hospital system for mental diseases of the senium were higher for (a) metropolitan than nonmetropolitan population; (b) males than females; (c) nonwhites than whites; (d) lower level education groups than higher level education groups; (e) divorced and separated than other marital categories, with the lowest rate among the married; (f) employed females than females keeping house; (g) males who are laborers, farmers, service workers, and craftsmen than males in other occupational groups. Proportional changes in these factors could affect admission rates.

The confidence with which one can accept the findings of this study are qualified by the fact that the analysis pertains only to those patients considered

Table 7a—Metropolitan (A and B) Average Annual First Admission Rates per 100,000 to Ohio Public Mental Hospitals for Those That Are Employed or Keeping House, by Sex and Age, 1948–June 30, 1952: Mental Diseases of the Senium

	Employed						Keeping House		
	Male			Female			Female		
Age	Total	A	B	Total	A	B	Total	A	B
All ages (crude)*	52.7	49.1	55.7	33.7	25.7	39.4	38.5	39.9	37.5
All ages (adjusted)*	82.3	73.6	90.1	72.6	54.9	84.7	28.3	29.6	27.4
45–54	3.1	2.7	3.4	1.9	1.1	2.4	2.9	3.8	2.2
55–64	31.6	31.2	32.0	19.8	15.9	22.7	20.7	22.0	19.8
65–74	174.3	156.6	188.9	148.3	124.0	164.4	73.9	75.9	72.5
75+	1,122.0	972.2	1,258.8	1,094.8	775.2	1,313.0	216.9	220.7	214.3

* Crude and adjusted rates based on keeping house and employed population 45 and over in the 1950 census of Ohio.

Table 7b—Average Annual and Age-Adjusted First Admission Rates per 100,000 to Ohio Public Mental Hospitals for Those That Are Employed or Keeping House, by Sex, Age, Color, and Residence,* 1948–June 30, 1952: Mental Diseases of the Senium

	Employed				Keeping House	
	Male		Female		Female	
Rate	White	Nonwhite	White	Nonwhite	White	Nonwhite
Crude	44.6	101.1	34.6	70.0	36.7	76.4
Age-adjusted	71.9	234.0	73.9	176.0	25.3	76.9

* Four metropolitan counties: Hamilton, Cuyahoga, Lake, and Franklin. Rates based on population 45 and over in the 1950 census of Ohio.

as first admissions to the state hospital system. Studies are needed to determine the rate of occurrence of such mental illness in the noninstitutionalized population of the community.[17] Concomitantly, data should be collected on patients admitted to any facility for the care of the aged mentally ill. Collection of such data is complicated inasmuch as there are a variety of facilities, such as homes for the aged, nursing homes, and chronic disease hospitals. Nevertheless, such data collection is necessary if one is to determine the amount of such mental illness, the characteristics of such patients, and the facilities used by such patients. For mental diseases of the senium, it is important to reiterate that on one hand not all such patients are cared for in the mental hospitals, and on the other hand that not all aged sent to the mental hospitals should be sent there.[18-23]

Institutional care, community care, and home care constitute but one aspect of the problem. Medical knowledge concerning prevention, treatment, and rehabilitation is constantly changing. Attitudes of both the aged and the community are changing or capable of being altered. In short, the interactions of biological, psychological, economical, environmental, and social forces in a complex matrix must be considered in a complete analysis of the problem.

For example, if illnesses which result

Table 8—Average Annual First Admission Rates per 100,000 to Ohio Public Mental Hospitals by Residence and Occupation for Males Aged 55 and Over, 1948–June 30, 1952: Mental Diseases of the Senium

Occupation	Metropolitan*	Nonmetropolitan*
Professional, technical, and kindred workers	49.8	69.0
Farmers, farm managers, and farm laborers	227.7	111.0
Managers, officials, and proprietors except farm	27.0	39.8
Clerical and kindred workers	32.7	46.3
Sales workers	59.1	77.7
Craftsmen, foremen, and kindred workers	77.3	93.7
Operatives and kindred workers	42.1	97.3
Service workers except private household	121.5	73.7
Laborers except farm and mine	307.6	285.5

* In order to use census population data by age, sex, and occupation, counties Allen, Belmont, Butler, Clark, Jefferson, and Lorain were shifted from the metropolitan to the nonmetropolitan group.

in inactivity and confinement tend to precipiate psychoses among the aged,[11] it seems reasonable to suppose that with improvements in medical care many such illnesses either will be prevented or the periods of confinement reduced, resulting in a decrease of psychoses among the aged. Concomitantly, improvements in medical care would increase the number living to the older ages, all of whom are theoretically subject to mental illness. It would be hazardous to predict the net effect on the rate of occurrence of mental diseases of the senium as influenced by improvements in medical care.

There are many other changes in our society which have positive and negative influences with regard to the rate of occurrence of mental diseases of the senium. In the main, however, changes in our society seem to be of the sort that may result in a decrease of mental illness among the aged. Physically, work is now less hard; leisure time is more abundant; economic security (pensions, old age assistance, and so forth) is improved; nutrition, health, and medical care are better; and educational levels are advancing. Also, isolation and/or boredom among the aged may be lessened in our society where travel is relatively easy and quick and where the telephone, radio, television, books, magazines, newspapers, and hobbies are so abundantly available.

Perhaps all these changes will alter the attitude of the aged who, at present, "dread the thought of being moved to an institution to die and desire to remain in their accustomed surroundings at home."[24] In addition, perhaps the character of the institutions for their care will change.

It will be several years before a clear picture emerges concerning the characteristics and needs of the aged mentally ill. Meanwhile, meaningful data collected in a consistent fashion by all interested agencies supplemented by appropriate psychological, biological, and sociological studies would materially assist in defining the problem and in providing solutions.

Appendix Table 1—Total Number of First Admissions to Ohio State Public Mental Hospitals by Age, Sex, Color, and Residence During the 4½-Year Period, 1948–June 30, 1952: Mental Diseases of the Senium

	Total						White						Nonwhite		
	Metropolitan			Nonmetropolitan			Metropolitan			Nonmetropolitan			Metropolitan		
Age	Total	A	B	Total	C	D	Total	A	B	Total	C	D	Total	A	B
Male															
Total	2,199	1,014	1,185	977	645	332	1,930	928	1,002	958	637	321	269	86	183
45–54	50	21	29	13	9	4	38	15	23	13	9	4	12	6	6
55–64	361	171	190	143	83	60	294	146	148	140	81	59	67	25	42
65–74	900	407	493	366	237	129	786	370	416	356	232	124	114	37	77
75–84	744	350	394	389	270	119	687	337	350	384	269	115	57	13	44
85+	144	65	79	66	46	20	125	60	65	65	46	19	19	5	14
Female															
Total	1,908	790	1,118	585	380	205	1,703	725	978	571	376	195	204	64	140
45–54	48	21	27	6	3	3	28	11	17	6	3	3	20	10	10
55–64	259	111	148	79	52	27	213	98	115	76	52	24	46	13	33
65–74	714	306	408	237	147	90	633	280	353	231	144	87	81	26	55
75–84	718	295	423	215	141	74	671	280	391	211	140	71	46	14	32
85+	169	57	112	48	37	11	158	56	102	47	37	10	11	1	10

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The problem of live oral vaccines for poliomyelitis is one of considerable current concern. Some of the problems associated with the use of such vaccines are presented in the following paper, and the evidence involved is discussed in detail.

PROBLEMS ASSOCIATED WITH THE USE OF LIVE POLIOVIRUS VACCINE

Joseph L. Melnick, Ph.D., F.A.P.H.A.

WE ARE IN the fortunate position today of being able to select between two vaccines—an inactivated one and a live attenuated one. With the continual improvements in the potency of the Salk vaccine, we now have available a vaccine with an effectiveness of over 90 per cent. In 1960, the chief problem of Salk vaccination rests with public health administrators whose responsibility it is to be certain that all susceptible persons in their communities are properly vaccinated.

The degree to which polioviruses circulate through the alimentary tracts of a completely vaccinated population remains to be determined. Earlier studies indicated that persons immunized by Salk vaccination carry virus with about the same frequency as nonvaccinated susceptibles,[17,18] but such studies need to be repeated with the more potent inactivated vaccines now available. Using infection with live vaccines to achieve the goal of eliminating naturally occurring polioviruses from communities is an attractive possibility, but whether it can be achieved will have to be answered by future work on a long-term basis in communities where such vaccines are being used.

Live polioviruses were first fed to human beings in 1952,[19] but the strains used were later felt to be too dangerous for continued administration in the field.[20] Later strains developed by Koprowski,[21] by the Lederle Laboratories,[22] and by Sabin[23] have now been fed to millions. All the strains in use have been obtained by laboratory manipulations which increase the ratio of attenuated to virulent poliovirus particles and then select the attenuated particles from the mixture. Some work which we presented at meetings in 1953[24] and 1954[25] but which have not appeared in detail may serve as examples.

The principle of purification of a microbial population by cloning was used. Rapid passage of a virulent strain (high ratio of monkey intracerebral virulence to tissue culture cytopathogenicity) was carried out in tissue culture to obtain a mixed viral population. Virus particles from the cultures at the end point of the titration (limiting dilution) were selected in order to obtain attenuated preparations (low ratio of monkey virulence to tissue culture cytopathogenicity). Table 1 lists some of the titration data illustrating the development of attenuated strains of all

Table 1—Decrease in Neurotropism of Poliomyelitis Virus Upon Serial Passage in Cultures of Monkey Nonnervous Tissue

Strain	Type	Number of Passages: Rapid Passage	Number of Passages: Plus Further Limiting Dilution Passages	Neg. Log Titer per ml: Intracerebral Inoculation of Monkeys	Neg. Log Titer per ml: Monkey Kidney Cultures
W-S	1	2		5	4
		35		4	5
		58		5 (irreg.)	6
		105		>1	7
		40	3	3 (irreg.)	5
		40	6	0.4	7
		40	12	1.0	6
		40	16	0.5	6
		40	23	0	7
		74	2	1.6	7
		74	7	1.0	6
		74	18	0	7
Y-SK	2	0		4	3
		19		5	5
		70		0	6
		109		>1	7
		87	2	0.5	>5
		87	7	0	6
		87	13	0	7
Leon	3	2		4	3
		10		4	5
		58		1	7
		99		>1	6
		60	2	0.3	6
		60	7	0	7

three poliovirus types by this procedure, similar to findings being made at this time by other investigators.[21-23]

Attenuated strains also occur in nature.[26] One of the strains which we worked with in 1954 (Charleston) had been isolated in a nonepidemic period and had been found to be naturally attenuated.[27] The Charleston strain is now being used in the inactivated vaccine prepared in Belgium, as a Type 1 replacement of the highly virulent Mahoney strain.

Early experiments[25] with one of our modified strains, W-S, in chimpanzees revealed the problems still associated with attenuated viruses today. Of four chimpanzees fed virulent virus in the form of monkey CNS, all became intestinal carriers and developed antibodies. Tests of the excreted virus indicated that it retained its full neurovirulence for the monkey. Of four animals fed the attenuated W-S virus (see Table 1), only one reacted ideally, becoming infected and excreting virus progeny which had the same low degree of virulence as the "vaccine" fed. Another animal in which intestinal multiplication was more abundant yielded a virus which reverted to full neurovirulence, while no "takes" occurred in the remaining two animals.

Thus here was a vaccine candidate strain which was rejected, because it sometimes failed to multiply in the intestinal tract; and when it did, it had the potential of reverting to increased neurovirulence. Subsequent work with similar partially attenuated strains in man showed similar increases in monkey neurovirulence.[20]

With the use of plaque technics (see Figure 1 for photographs of typical plaques), more highly purified progeny of single virus particles were obtained by Sabin,[23] by the Lederle group,[22] and by Koprowski[21] and were tested for neurovirulence. Strains having low neurovirulence for monkeys are now incorporated in vaccines being used in field trials around the globe.

The ultimate safety of live poliovirus vaccine rests on the long-term results of its use in the field. Safety must be evaluated on the basis of the vaccine being used in fully susceptible persons —those who have lost maternal antibodies, and who have never been infected naturally, and who have never received inactivated vaccine. In certain areas of Europe and recently in Miami in this country, the live vaccine has been given to large numbers of children who had been previously immunized with Salk vaccine. If unadjusted for immunes, data from such areas—as well as from other areas where the degree of natural immunity is high, as in Mexico and Central and South America—are of limited value in assessing the safety of the vaccine.

However, regardless of the field experience, the laboratory serves an essential function in supplying information on the properties of the virus in the vaccine, particularly whether these properties remain constant in successive manufacturing lots of virus vaccine and whether they remain constant after multiplication in vaccinated human beings.

To be of value, the laboratory

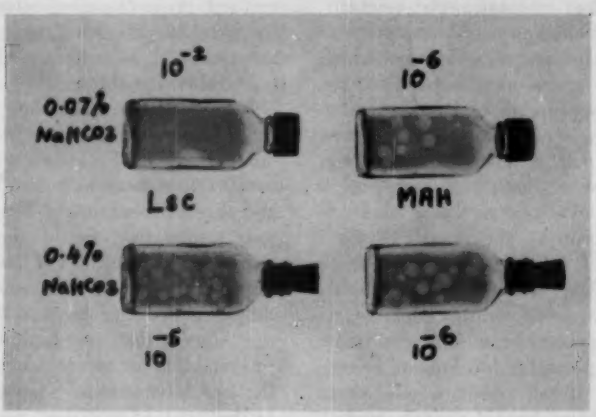


Figure 1—Plaques of virulent Mahoney and attenuated LSc Type 1 polioviruses on monkey kidney monolayers under agar at $NaHCO_3$ concentrations of 0.07 per cent and 0.4 per cent. There is no influence of bicarbonate concentration on the number or size of plaques for the Mahoney virus at 10^{-6} concentration. No plaques developed under the acid (0.07 per cent bicarbonate) overlay with LSc virus even though the concentration used (10^{-2}) was a thousand-fold greater than that used (10^{-5}) under the alkaline overlay (0.4 per cent bicarbonate).

Table 2—Comparative Titrations for Neurovirulence of Type 3 Candidates

Route of Inoc.	Conc. of TC Fluid	Monkeys Which Received Lederle-Cox Strain				Monkeys Which Received Sabin Strain			
		Developing Weakness or Paralysis of Polio*		Developing Cord Lesions of Polio		Developing Weakness or Paralysis of Polio*		Developing Cord Lesions of Polio	
		Baylor	DBS‡	Baylor	DBS	Baylor	DBS	Baylor	DBS
Intracerebral	Undil.	3/10†	1/5	3/10	2/5	0/10	0/10	0/10	0/10
	10^{-1}	2/6	0/5	2/6	1/5	0/6	0/4	0/6	0/4
	10^{-2}	0/6	1/5	0/6	1/5	0/6	0/5	0/6	0/5
	10^{-3}	—	0/3	—	0/3	—	—	—	—
	10^{-4}	—	0/5	—	0/5	—	—	—	—
Intraspinal	Undil.	8/10	4/5	10/10	5/5	9/10	—	10/10	—
	10^{-1}	6/6	5/5	6/6	5/5	3/6	3/5	6/6	5/5
	10^{-2}	6/6	4/5	6/6	5/5	3/6	0/5	6/6	5/5
	10^{-3}	4/4	3/4	3/4	4/4	0/4	0/5	2/4	3/5
	10^{-4}	1/4	0/5	2/4	2/5	0/4	0/4	0/4	2/4
	10^{-5}	—	0/5	—	2/5	—	1/4	—	0/4

* Progressive weakness or paralysis beyond the second day after inoculation.
† Numerator = number of monkeys positive; denominator = number of monkeys inoculated.
‡ Division of Biologics Standards, National Institutes of Health.

methods should be able to allow us to discriminate among strains according to their degree of attenuation for monkeys. As minimal monkey neurovirulence was the only criterion of safety on which the vaccine strains were selected for use in man, this property of monkey pathogenicity should not now be glossed over by saying that it has little or no significance for evaluating the safety of a poliovirus. We have no other bona fide way of measuring the degree of virus attenuation. Strains which show more neurovirulence than the most highly attenuated vaccine strains must be regarded as possessing a somewhat more dangerous potential for human beings. This holds if we compare one strain with another as candidates for incorporation in the vaccine, or if we compare the vaccine virus with its progeny after multiplication in the intestinal tract of a vaccinated child. Just how much of a departure, or reversion, from the highest degree of attenuation can be safely tolerated in man remains an unanswered question, but by using strains of the highest degree of attenuation and by using strains which are also stable genetically, I hope that we shall never have to answer the question.

Comparison of Candidate Strains for Monkey Neurovirulence—Two impartial laboratories have carried out extensive comparative tests with the Lederle-Cox and the Sabin strains.[1,2] Their comparative results for one of the types are shown in Table 2. The results are of importance for several reasons. First, despite many allegations to the contrary, they show a relatively high degree of reproducibility of neurovirulence tests in the two laboratories. Second, the tests in these two laboratories are more sensitive than those reported by Sabin or Cox. Third, they discriminate between strains possessing different degrees of attenuation. It is readily apparent that the Sabin strains are more highly attenuated; for after intracerebral

inoculation they are virtually without neurotropic activity, and after intraspinal inoculation they yield less than 10 per cent of the clinical disease produced by the Lederle strains at the same doses.

Other analyses of the neurovirulence data bear this out. When the intensity of the cord lesions are graded by our scoring method,[1] the lower scores of Sabin strains again show them to be more attenuated than the Lederle strains. In the results shown in Table 3, the polio lesions produced in the lumbar cord by the intraspinal injection of Sabin's Type 1 virus are graded arbitrarily as 100 units, as a point of reference. The scoring of lesions supplies additional information, allowing us to discriminate further among strains which are virtually avirulent by intracerebral injection. Thus from the data in Table 3, Sabin's Type 2 strain offers advantages over his Type 3 strain even though both are intracerebrally avirulent. The Type 2 strain not only produces less activity in the spinal cord near the lumbar site of injection, but it hardly spreads to involve the cervical areas of the spinal cord. The Type 3 strain which shows a higher degree of activity in the lumbar area—and perhaps more important, a higher degree of spread to the cervical area—is the Sabin strain which seems to be least desirable in the field. That is to say, there is an association of this measurable laboratory property with the tendency of the virus to become more monkey-neurovirulent in nature after it multiplies in vaccinated persons.

Lastly, another measure of monkey neurovirulence may be obtained by injecting monkeys outside the CNS and determining whether virus finds its way into, and multiplies in, the target organ to produce paralysis. Recent experiments have shown that the Lederle Type 1 vaccine virus paralyzes monkeys after intramuscular injection, a property not associated with more highly attenuated strains.

Wild Enteroviruses Interfering with Vaccine Virus Takes—Assuming that the attenuated viruses of lowest neurovirulence are safe for human vaccination, we must consider the question of their effectiveness as immunizing agents. Pertinent data are now becoming available from investigators in various parts of the globe.[3] For purposes of illustration, I shall cite some of our observa-

Table 3—Comparative Histological Lesions of Candidate Strains

Type	Strain	Monkey Kidney TCD_{50}	Intracerebral Inoculation: Polio Lesion Scores* in Cervical Spinal Cord	Intracerebral Inoculation: Polio Lesion Scores* in Lumbar Spinal Cord	Intraspinal Inoculation: Polio Lesion Scores* in Cervical Spinal Cord	Intraspinal Inoculation: Polio Lesion Scores* in Lumbar Spinal Cord
1	Lederle	$10^{7.3}$	54	78	101	191
	Sabin	$10^{7.3}$	0	3	15	100
2	Lederle	$10^{6.6}$	58	84	121	212
	Sabin	$10^{7.2}$	0	0	5	41
3	Lederle	$10^{7.2}$	21	28	70	150
	Sabin	$10^{7.3}$	0	0	42	101

* Undiluted through 10^{-2} used for calculation of polio lesion scores for monkeys inoculated intracerebrally, and undiluted through 10^{-4} for those inoculated intraspinally.
Score for lumbar cord with Sabin's Type 1 strain inoculated intraspinally is arbitrarily designated 100 units, and the other scores computed accordingly.

tions carried out in a small trial with live poliovirus vaccine in Mexico City,[4] because the general problems are brought into sharp focus by the results. The study illustrates that even a small trial can yield results of general significance if the field and laboratory follow-ups are carried out in sufficient detail.

An observation well established in poliomyelitis was made once again, namely, that children possessing antibodies as a result of natural infection were immune to reinfection. In contrast, children with maternal antibodies proved to be as fully susceptible to the vaccine virus as children without antibodies. Of 104 observations on children with high levels of antibodies before vaccine feeding, there were only ten instances of virus excretion, all in children in the first few months of life and still possessing maternal antibodies.

Of the 82 serologically susceptible children, only 37 had an antibody rise to the vaccine virus, and most of those who developed antibodies excreted virus. Of the 45 serologically susceptible children who failed to develop antibodies, almost all failed to become carriers of the virus.

In an attempt to explain the failure of the vaccine to infect serologically susceptible children, we then looked into the viruses present in our study group before the virus was fed. For this purpose, swabs had been collected prior to the administration of the vaccine virus. It seems clear from the results that current infection with nonpolio enteroviruses interferes with the establishment of poliovirus infection even in children free of polio antibodies.

The children tested for all three types were divided into two groups: those who did not excrete nonpolio viruses before vaccine feeding and those who did. Of the 28 children in the first group, 22 excreted poliovirus and showed homotypic antibody rises. In the second group, the children who excreted nonpolioviruses before vaccine feeding, the situation was reversed. Most of these children (33 of 47 tested) did not produce antibodies and did not excrete homotypic virus, as a result of the interfering effect of the nonpolioviruses occupying their intestinal tracts. However, this did not take place in all children infected with nonpolioviruses. Thus, of the remaining 14 children in the group, who in spite of infection with other enteroviruses did produce polio antibodies, 10 excreted homotypic virus also. This suggests that only certain enteroviruses may act as interfering agents for poliovirus, or that timing and dosage play a role, as has been observed in quantitative experiments on poliovirus interference in tissue culture.[5]

These results, as well as those of other investigators,[6,7,8] indicate that the enteric tract of a child may be temporarily committed to the production of a nonpoliomyelitis enterovirus, blocking the establishment of infection and immunity by the vaccine virus in as many as 50 per cent of poliomyelitis-susceptible children. Even if safe, a vaccine with such a low rate of effectiveness in areas where enterovirus infections are common might well be of limited usefulness.

Comparison of Vaccine Virus and Its Progeny after Multiplication in Human Beings—Perhaps the most important question to be answered in regard to the public health acceptance of live poliovirus vaccine in this country hinges on the genetic stability of the virus strains in the vaccine. Our approach to this problem has been dependent upon the newly described in vitro tissue culture markers. We have determined whether the vaccine viruses have changed with regard to these markers after multiplication in man and have selected the altered viruses for the expensive neurovirulence tests.

Recently, several markers of poliovirus have been described which can be followed by tissue culture methods

and which tend to discriminate between neurovirulent and attenuated strains. Strains possessing the d+ marker grow more rapidly than d− strains at low bicarbonate concentration under agar (see Figure 1).[9,10] Strains possessing the MS+ marker grow more readily on a monkey stable kidney cell line than MS− strains.[11] Strains possessing the T+ marker[12] grow readily at 40° C in contrast to the T− strains (Figure 2).

Virulent wild strains usually possess d+, MS+, and T+ markers and thus differ from highly attenuated strains which are d−, MS−, and T−. We have tested a number of wild strains from the Houston area for the T marker and the results are shown in Table 4. Of 62 strains tested, 49 were T+, 5 were T±, and 8 were T−. The distribution of strains between T+ and T− was similar, regardless of whether they were isolated from frank paralytic cases or from aseptic meningitis cases due to poliovirus. In a similar series, Sabin found that of 52 strains from polio patients, 49 were T+ and 3 were T±.

Two newly described markers which have had little application as yet include the E marker and the antigenic marker. The E marker is dependent upon the differential absorption and elution of virulent and attenuated strains on cellulose columns.[13,14] The antigenic marker recognizes that even within the same poliovirus type, strains differ in the rate at which they are neutralized by homologous and heterologous antisera.[15] In our laboratory, the test has been modified by incorporating the serum in the agar overlay and then adding the virus in the form of a disc containing 1,000 PFU. Heterologous strains break through at higher concentrations of serum and produce confluent plaques around the disc. Figure 3 illustrates the difference between the LSc vaccine strain and a virulent Type 1 Houston strain recovered from a fatal case. It has been suggested that the antigenic marker is more stable than the other markers and might well prove useful in being able to identify a strain as the progeny of a vaccine virus, regardless of whether or not the excreted virus

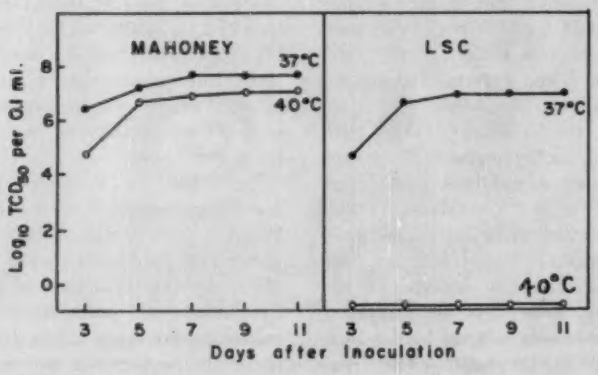


Figure 2—Effect of temperature on titers of T+ Mahoney and T− LSc Type 1 polioviruses in monkey kidney tube cultures (average results of 10 experiments).

Table 4—Results of T Tests Performed with Strains Isolated from Paralytic and Aseptic Meningitis Patients in Houston in 1958–1959

In vitro Character*	Strains from: Paralytic Cases	Aseptic Meningitis Cases	Total
T+	40	9	49
T±	5	0	5
T−	7	1	8
Total Number Tested	52	10	62

* T+ = log $I_{40°}$ 0 to 2; T± = log $I_{40°}$ 2.1 to 5; T− = log $I_{40°}$ >5
$I_{40°}$ = inhibition at 40° C
log $I_{40°}$ = log TCD_{50} at 37° C minus log TCD_{50} at 40° C

shows changes in other markers. However much more work is needed in this area to see if such a generalization holds true.

The next part of this presentation will be concerned chiefly with the d and T markers of Sabin's attenuated Types 1, 2, and 3 polioviruses after multiplication in children and the correlation of these markers with monkey neurovirulence. Eighty-five homotypic strains isolated from 71 test children at different periods after vaccination were subjected to the d and T tests. The results obtained are illustrated below.

Tests for the d marker were performed in bottle cultures,[10] using monkey kidney monolayers grown and maintained in our lactalbumin medium.[16] Parallel virus titrations were performed using 0.1 and 0.4 per cent bicarbonate. The low bicarbonate or acid cultures were kept in stoppered bottles or in loosely capped bottles in a 10 per cent CO_2 incubator. The virus inoculum was 0.1 ml, and three bottles were used for each dilution. The virus titers were calculated on the basis of the plaque count on the third day after virus seeding.

The d+ Mahoney virus grew equally well in both bicarbonate concentrations, with negligible variations in the I_{acid} (inhibition under acid overlay) value from test to test. For each strain the log I_{acid} equals log PFU/ml at 0.4 per cent bicarbonate minus log PFU/ml at 0.1 per cent bicarbonate. The I_{acid} values for the d−LSc virus were usually at least 2.0 $\log_{10}$ units, i.e., there was at least 99 per cent inhibition of growth. Each d character test included not only the new strains under study on a particular day, but also the LSc and Mahoney viruses as control d− and d+ strains. When Types 2 or 3 isolates were tested, attenuated and virulent Types 2 or 3 viruses, respectively, were included as controls.

From the titers at the two bicarbonate concentrations, the I_{acid} values were obtained for the test and control viruses. Since it was desirable to express our results uniformly throughout the study, several arbitrary values were introduced. In each test the I_{acid} values for the unknown strains and the control viruses were established, and the character of each strain was determined as follows: d− strains, having I_{acid} values within one log of the LSc value; d+ strains, having I_{acid} values within one log of the Mahoney value; and d± strains, having all the intermediate values. The character of each strain was determined on the basis of the results of two and sometimes three tests.

Tests for the T marker were performed in monkey kidney tube cultures. Parallel virus titrations were performed under two conditions: using 37° C and 40° C for the incubation of the culture. Cytopathic end point titers were estimated on day seven. The differences in titers obtained at the two temperatures were expressed as $I_{40°}$ (inhibition at 40° C) values (log $I_{40°}$ = log TCD_{50} per 0.1 ml at 37° C minus log TCD_{50} per

0.1 ml at 40° C). Mahoney and LSc virus were included as controls in each test. The $I_{40°}$ values for Mahoney never exceeded 1.0 $\log_{10}$ unit, while the values for LSc were always greater than 5 $\log_{10}$ units.

The strains tested were separated arbitrarily into three groups: T+ strains, those having $I_{40°}$ values of 2 log units or less; T− strains, those having $I_{40°}$ values greater than 5 log units; and T± strains, intermediate, yielding $I_{40°}$ values between 2 log units and 5 log units. The character was usually determined on the basis of the results of two tests run on different days. It was observed that when a strain reverted from d− → d+, it was not always associated with a T− → T+ reversion. However, a T− → T+ reversion was usually linked with a d− → d+ or a d− → d± reversion.

An illustration of the degree of alteration in the homotypic polioviruses excreted by orally vaccinated children is shown in Table 5. Homotypic virus indicates poliovirus of the same type as that in the vaccine fed, and excreted after the feeding. The table includes the code numbers of the children, the types of virus isolated in their pre- and post feeding specimens, and the d and T characters of the homotypic polioviruses excreted. The squares around some of the poliovirus isolates indicate those which were tested in monkeys.

It can be seen that the first two children in this table who excreted Type 1 poliovirus for several weeks revealed a change from d to d+ character in their third and second isolates, respectively, with no change in the T character. On the other hand, children numbers 372, 376, and 126 excreted d+T− viruses in the first week after feeding, thus indicating an early alteration of the

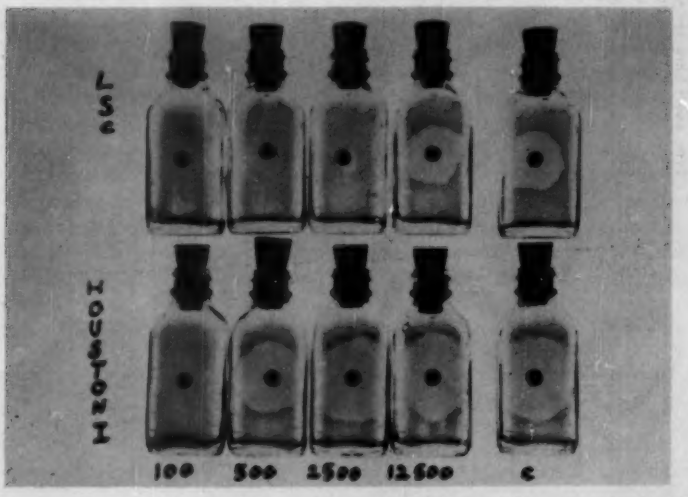


Figure 3—Antigenic differences between attenuated LSc and Houston virulent Type 1 polioviruses as determined by the degree of neutralization with LSc guinea pig antiserum. LSc antiserum was incorporated in the agar overlay in fivefold dilution steps; discs containing 1,000 plaque-forming units of each virus were then placed on top of the agar. At each serum dilution, the degree of neutralization was measured by the presence and size of the plaque area formed by the virus around the disc.

Table 5—Representative Results of d and T Character Tests with Homotypic Poliovirus Excreted by Orally Vaccinated Children

Child No.	Pre-Feeding	Type and Character of Virus Isolated from Specimens: Post-Type 1 7 da	Post-Type 1 14 da	Post-Type 1 21 da	Post-Type 3 7 da	Post-Type 3 14 da	Post-Type 3 21 da	Post-Type 2 7 da	Post-Type 2 14 da	Post-Type 2 21 da
4	0	P1 d−T−	P1 d−T−	P1 d+T−	0	NP	P3 d+T−	P3 d+T−	....	....
268	0	P1 d−T−	P1 d+T−	0	0	NP	NP	P2 d−T−	P2 d+T−	0
107	0	0	0	0	P3 d+T−	P3 d+T−	NP	0	P3 d+T−	0
372	0	P1 d+T−	P1 d+T−	0	P3 d+T−	P3 d+T+	P3 d+T+	0	0	....
376	0	P1 d+T−	P1 d+T−	0	0	0	NP	....	....	P2 d+T−
126	0	P1 d+T−	0	NP	NP	0	NP	P2 d+T−	P2 d+T−	....
244	0	0	0	0	0	0	0	0	P2 d+T−	d+T−

P1 = Poliovirus Type 1; P2 = Type 2; P3 = Type 3; NP = Nonpolio virus; 0 = negative; .... indicates no specimen.
□ indicates strain tested in monkeys.

vaccine virus in at least one character, during multiplication in the intestinal tract. The majority of the Type 3 isolates were of the d+T− character, and some underwent further reversion to d+T+, while the frequency of change in the Type 2 isolates was similar to that of the Type 1 strains isolated.

Summarized in Table 6 are the results on 85 strains recovered from vaccinated children. In 23 strains, there was no detectable alteration in the virus; in 46 others, the recovered virus changed in the d but not in the T marker; and in 16 others changes occurred in both markers. Thus in 19 per cent of the children infected with d−T− strains, the excreted virus had changed in at least two properties.

Strains with different degrees of alteration in these two markers were selected for monkey neurovirulence tests. The strains had all been isolated in monkey kidney cultures maintained in M−E medium at pH 7.4. (The M−E medium contained 0.5 per cent lactalbumin hydrolysate, 1 per cent monkey serum, in Earle's balanced salt solution.) However, to insure that we were not selectively enhancing the proportion of monkey paralytogenic strains by passage of the human virus in tissue culture, a number of rectal swabs obtained from the vaccinated children were inoculated directly into monkeys by the intraspinal route. The dose of virus in such material which could be inoculated was very small indeed, varying from only 10 to 60 TCD_{50}, so that selection of virulent viruses from a tremendous excess of thousands or millions of avirulent virus particles by the monkey CNS does not play a role in these results.

A summary of the monkey tests on strains of the 3 types is shown in Table 7. It is apparent that excreted strains which retain the d−T− markers of the vaccine virus are not significantly more virulent for monkeys than the vaccines themselves—about 10,000 TCD_{50} being required to paralyze 50 per cent of the monkeys inoculated intraspinally, and no illness being produced either by undiluted tissue culture fluid inoculated intracerebrally or by the rectal swabs inoculated intraspinally. The d+T− strains show increased activity, both intraspinally and intracerebrally, when compared to the d−T− vaccine virus. Thus only 10 TCD_{50} of the cultured virus were found to contain one monkey paralyzing $dose_{50}$ (intraspinal), and some of the strains were also active after intracerebral inoculation. Furthermore, 10 to 60 TCD_{50} of virus in the rectal swabs themselves produced paralysis in a significant number of test monkeys inoculated intraspinally.

Cytopathogenic virus was recovered from the spinal cords of almost all monkeys sacrificed soon after the onset of paralysis, indicating that no selection of strictly neurotropic virus had taken place in the CNS of the monkeys.

Table 6—Character of Homotypic Poliovirus Excreted by Vaccinated Children

Virus Type	d−T−	d±T−	d+T−	d+T±	d+T+	Total
Polio-1	19	9	9	0	0	37
Polio-2	3	3	17	2	0	25
Polio-3	1	0	8	2	12	23
Total	23	12	34	4	12	85

Table 7—Monkey Neurovirulence of Poliovirus Type 1, 2, and 3 Strains as Related to Their d and T Characters

Strains of Polio-1,2,3	Number Strains Tested	Character d	Character T	Number of Monkeys with Poliomyelitis/Number Tested: Log10 TCD_{50}: Intraspinal 6.0	5.0	4.0	3.0	2.0	1.0	Intracerebral 7.0–6.0	Rectal Swab IS 1.8–1.0
Vaccines	3	d−	T−	21,4*/27	10,2*/16	8,2*/16	2,1*/8	2*/8		0/32	
After Human	6	d−	T−				8/12	1*/9		0/3	1/7
Passage (M)†	1	d±	T−					2/2	0/2		2/2
	8	d+	T−					16/16	6/16	5,2*/10	5/11
	2	d+	T+					3/3	3/4	5/5	2/2
After Human Passage (C)†	5	d+	T+					3/4	4/9		
Wild (M)	1	d−	T−	2/2	2,1*/4	2*/4	0/2			0/3	0/2
	1	d+	T+					2/2	1/2	1/1	

* Nonparalytic poliomyelitis † M = Mexico C = Cincinnati

Table 8—Chimpanzee Intraspinal Neurovirulence of Sabin's Type 3 Vaccine Strain Before Feeding and After Multiplication in Children

Chimpanzee	Strain Inoculated	Disease	Polio Lesions in Spinal Cord: Cervical	Thoracic	Lumbar	Needle Tract Lesions in Lumbar Cord*
Gamma	Type 3 Vaccine	Neg.	0	0	5 (0/++)	1,8
Delta	Mexico Specimen No. 2576	Complete paralysis of both legs, and right arm	40 (0/+++)	26 (0/+++)	68 (++/++++)	2,10
Zeta	Cincinnati Specimen No. S-33	Complete paralysis of both legs	24 (0/+++)	10 (0/++)	49 (0/++++)	8

* Numbers in this column refer to the level or levels where the needle tract lesion was found; for this purpose the lumbar cord was arbitrarily divided into 10 consecutive blocks.

The strains which changed in both markers, that is, to d+T+, showed even greater neurovirulence. In monkeys, only 10 TCD_{50} of passage virus, or the same small dose as present in the rectal swab, produced paralysis when inoculated intraspinally. In addition, the undiluted passage virus proved to be paralytogenic in all the monkeys inoculated intracerebrally. Two d+T+ strains, one recovered from a 2-month-old vaccinated child in Mexico City and one from a child vaccinated in the winter in Cincinnati by Sabin, were selected for inoculation not only into monkeys, but also into chimpanzees, as members of this species are known to be much less sensitive to intraspinal administration of attenuated poliovirus than monkeys. As shown in Table 8, we confirmed Sabin's results, in that the vaccine itself was negative when undiluted material was injected intraspinally into the chimpanzee. The d+T+ isolates, however, produced paralysis and severe cord lesions.

Figure 4 is a diagrammatic expression of the intraspinal virulence of the vaccine strains and the isolates which were studied. The per cent of monkeys with polio is expressed as a function of the virus dose used. One can observe that the curve for the d−T− isolates does not differ much from the curve obtained with the vaccine strains. On the other hand, there is a minimal difference between the d+T+ isolates and those which underwent change in the d character only (d+T− isolates). Both types of isolates underwent a shift of about 3 logs toward increased neurovirulence, i.e., they were one thousand times more

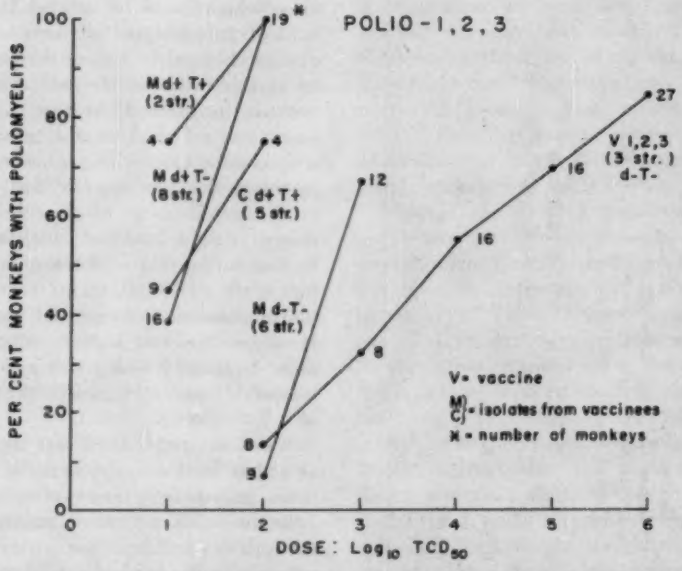


Figure 4—Intraspinal monkey neurovirulence of poliovirus Type 1, 2, and 3 vaccine strains before and after multiplication in children. Horizontal coordinate represents log TCD_{50} dose administered; vertical coordinate indicates the per cent of the monkeys which developed poliomyelitis.

Table 9—Effect of Serial, Cord to Cord, Monkey Passages on the Neurovirulence and T Character of T− Type 2 Poliovirus Isolated from a Vaccinated Child

Mexico Isolate No. 3485 R. Sw. (Polio-2)		R. Sw. IS → 60 TCD_{50}	Cy 502	cord IS → 10 TCD_{50}	Rh 726	cord IS → 30 TCD_{50}	Cy 706
			CPBL, 5		CPRL, 6		CPBL, 5
			C 25 (0/++)		C 27 (0/++)		C 25 (0/++)
			L 65 (++/++++)		L 52 (++/++++)		L 70 (++/++++)
	R. Sw.	K_1	cord	K_1	cord	K_1	cord	K_1
At 37°	1.8*	6.0	2.9	7.5	2.5	6.2	2.8	5.8
At 40°	<1.0*	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	?	T−	T−	T−	T−	T−	T−	T−

* Logio TCD_{50} per 0.1 ml.

virulent for the monkey spinal cord than the vaccines which had been fed to the children. Data of this type bring up the question of whether the CNS of the monkey could act as a medium to encourage further changes in modified strains of the d+T− type, and only completely altered d+T+ particles would then continue to multiply and produce paralysis in the inoculated animals. If this were the case, one would expect the spinal cords of such animals to yield only T+ progeny. Experiments to elucidate this question were undertaken.

Passage of T− Strains in Monkeys by Passage of Infected Spinal Cord—Because some T− strains referred to in the previous section proved to be pathogenic for monkeys, we undertook a study of the character of the virus propagated in a monkey spinal cord; that is to say, we inoculated the T− virus and then determined whether the virus which could be isolated from the cord of the paralyzed monkeys was T− or had changed to T+ in the course of its multiplication in the central nervous system. In Table 9, we can follow the passage of a Type 2 virus obtained from a vaccinated child. The initiating virus in this series was actually that present in the rectal swab of the child. As shown at the left of the table, the virus had an initial titer of 1.8 logs at 37° C but < 1 at 40° C. This titer is too low to allow one to assess its T character. However, the first kidney culture passage, designated as K_1, had a titer of 6 logs at 37° and < 1 at 40°, the pattern of a T− virus.

When the rectal swab was inoculated at a dose level of only 60 tissue culture doses intraspinally into cynomolgus No. 502, the monkey became paralyzed on the fifth day and developed severe lesions not only in the lumbar cord, but also in the cervical cord. The letters C and L refer to the cervical and the lumbar regions of the cord; the number refers

to the intensity of the lesion with the scale being 0-80 (80=maximum lesions possible in ten sections). As one can see, the cord material had a titer of 2.9 and was T−, as was the kidney tissue culture passage, there being an inhibition of over 6.5 logs when the virus was titrated at 40°. Subsequent passage with only ten tissue culture doses into rhesus No. 726 produced paralysis in this animal on the sixth day, again with severe lesions in both the cervical and the lumbar parts of the cord. Again, the virus isolated was T−. A further passage with only 30 tissue culture doses into cynomolgus No. 706 again produced paralysis in this animal, and the virus isolated from the cord retained its T− character.

Thus we have here a virus which has been passed from spinal cord to spinal cord through three serial transfers; and after these three passages, the virus still retains the T− character, the character which is usually associated with a virus that is not supposed to grow in the central nervous system.[12] Obviously this is a virus marker which, whatever its usefulness may be, does not always indicate whether or not a virus has a capacity to grow and destroy cells of the CNS and thus cause paralysis of the monkey.

Table 10 is concerned with a Type 1 virus, again a T− strain. As shown in the top part of the table, this virus was passed serially by direct spinal cord to spinal cord passage at very low tissue culture doses, between 30 and 100. For the first two passages the virus was completely T−; at the end of the third passage, it was T±, that is, the inhibition at 40° was 2 to 5 logs of virus.

After the second passage, the virus in the cord of rhesus No. 722 was passed along to rhesus No. 728 by the intramuscular route, again producing paralysis. A T− virus was isolated from the spinal cord, but this apparently had now become a mixed population of particles, for the virus was T± in the first kidney culture passage.

Subsequent inoculation in cynomolgus No. 829 again produced paralysis, this time with the virus reverting to a fully active T+ state both in the cord and in its kidney culture passage.

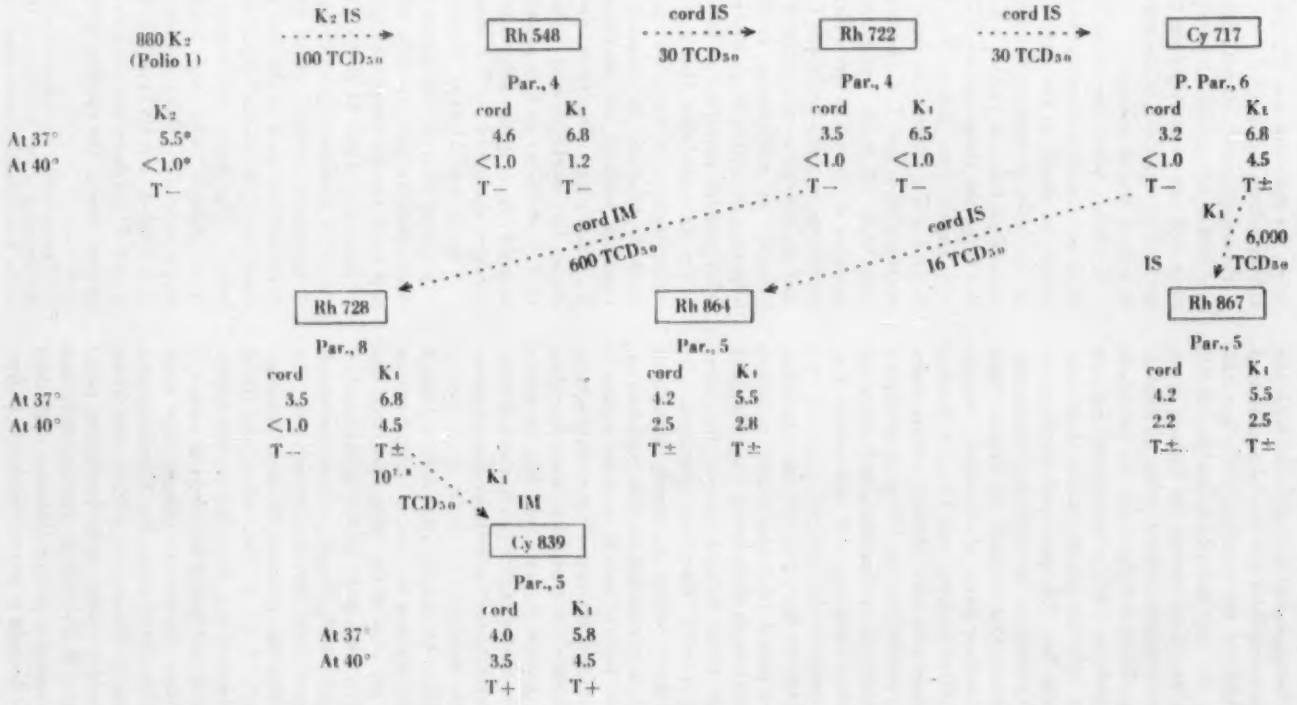
Similarly, when the virus from the third nervous system passage was further passed, as shown in the right-hand part of the table, to another monkey by the intraspinal route, it yielded a T± virus. But when the tissue culture K_1 material was passed (see rhesus No. 867), it yielded a T+ virus. So here we have evidence that the T− character of a virus may be stable for a number of passages in the CNS, but under certain conditions may change to the T+ state; that is, the virus now isolated has the property of multiplying at 40°, thus behaving as most wild viruses recovered from patients paralyzed in nature.

The data also show that a virus after multiplication in man may possess a marked increase in monkey neurovirulence without an alteration of its T− character. The virus, now neurotropic for monkeys, may either retain its T− character as it is passed serially in monkeys, or it may after a number of passages change to the T+ state.

Viremia and Monkey Neurovirulence —We now turn to the question of the neurovirulence and viremia which follow upon the intramuscular inoculation of monkeys.* Table 11 shows a comparison of 4 virulent strains from nature; 3 attenuated strains, these being the Sabin strains used in the live poliovaccine; and 24 strains designated "isolates." The latter are strains isolated from children who had received the Sabin material; they include 3 Type 1, 2 Type 2, and 19 Type 3 strains. The d and T markers are indicated in the second column, the virulent strains being

* These studies are being carried out with the assistance of Dr. Julio Barrera Oro, Fellow of the World Health Organization.

Table 10—Effect of Serial, Cord to Cord, Monkey Passages on the Neurovirulence and T Character of T− Type 1 Poliovirus Isolated from a Vaccinated Child



* Log_{10} TCD_{50} per 0.1 ml.

d+T+, and the attenuated strains being d−T−. The isolates selected for tests in monkeys were those which had changed after multiplication in children, from the d− state of the vaccine to the d+ state. Also, 21 of the 24 isolates had changed in the T marker, from negative to positive. The next column indicates the dosage which was used. All the attenuated viruses and the isolates were tested at a dosage of at least 7 logs of virus; the virulent strains were tested in two dose ranges—undiluted tissue culture fluid having a titer between 7.8 and 8.8 logs of virus per ml and also dilutions representing dose levels of 3.8 to 6.5 logs of virus.

Now as for the results, with the virulent strains we find that of 36 monkeys inoculated with undiluted tissue culture material, 35 showed clinical responses; 34 with paralysis, and one with only weakness. All 35 developed polio lesions. With the lower dose of virulent virus, 11 of the 16 animals developed disease, and this was also associated with lesions. As shown in the last three columns of the table, viremia was present on days two, three, and four, being a relatively common finding when a virulent strain was inoculated intramuscularly into monkeys. This was true both with cynomolgus and with rhesus monkeys.

The attenuated strains yielded an entirely different picture. Of 64 monkeys on these tests, none developed disease and only 5 showed lesions, all of these being mild. The pattern of viremia was also different. Of 36 animals studied on the second day, 12 were positive, all being Type 2.

The chief importance of these data reside in the bottom two rows of the table, the data pertaining to the isolates. For the 3 d+T− isolates, 5 of 6 monkeys developed disease; 2 with paralysis and 3 with weakness. All 6 animals showed lesions in the spinal cord; 2 being severe and 4 mild. For the 21 d+T+ strains, 52 monkeys were used; 17 developed flagrant paralysis, 5 developed weakness, and 26 of the animals developed lesions—an attack rate of 50 per cent. As regards viremia, this was a common finding on the second day, when 33 of 50 animals were positive but tapered off on the fourth day, when

Table 11—Neurovirulence and Viremia after Intramuscular Inoculation of Monkeys with Virulent and Attenuated Polioviruses and Poliovirus Isolates from Vaccinees and Contacts

Strains and No. Tested	d,T Markers	Dose Log TCD_{50}	Intramuscular Neurovirulence: No. of Monkeys	No. with Disease: Par.*	Wk.*	No. with CNS Lesions	Viremia: No. Pos/Total at Days 2	3	4
Virulent									
4	d+T+	7.8–8.8	36	34	1	35 (1 mild)	20/22	18/24	
		3.8–6.5	16	10	1	11	10/12	12/16	9/16
Attenuated									
3	d−T−	7.8–8.5	64	0	0	5 (all mild)	12/36†	0/8	0/12
Isolates									
3‡	d+T−	7.4–8.5	6	2	3	6 (4 mild)	0/2		0/2
21§	d+T+	7.0–8.5	52	17	5	26 (2 mild)	33/50		7/46

* Par. = paralysis
Wk. = weakness

‡ 3 Polio-1

§ 2 Polio-2 and 19 Polio-3

† All 12 monkeys with viremia received Type 2 P_{712} vaccine virus.

only 7 out of 46 animals were positive.

Genetic change as measured by reversion in the dT markers to d+T+ is not always associated with increased intramuscular neurovirulence. Other factors as yet unknown are also involved. We were given the opportunity of studying specimens from two families fed Type 3 virus in the Fox-Gelfand study in New Orleans. The vaccinated children in two families excreted a T− virus on the first day and a T± virus on the second day after the feeding, but later samples were d+T+. The d+T+ specimens from the vaccinated children failed to produce lesions or disease in 4 monkeys although all 4 animals developed viremia on day two, and 3 on day four. In contrast d+T+ specimens from three family contacts were virulent for the 6 monkeys used in the tests. Thus here we have an example of a virus which had an initial change in its dT character in the vaccinated child, but which underwent a further change associated with a further increase in neurovirulence upon serial human passage of the virus.

These data were collected in an attempt to answer the question of the genetic stability of the vaccine viruses which are being tried now in the field in many parts of the world. A significant proportion of vaccinated children excrete viral progeny which show an increase in monkey spinal neurovirulence over that in the vaccine. Examples of this were clearly demonstrated in this report. Data obtained by the intraspinal route have been severely criticized by some on the assumption that the associated traumatic damage in the cords could account for the high rate of paralysis observed in our intraspinally inoculated monkeys.[3] The new intramuscular data indicate clearly that viruses which are recovered from vaccinated children and which show changes in certain of their genetic characters show concomitant increases in their neurovirulence for the monkey, even when inoculated by a peripheral route which deposits the virus far from the site of the lesion in the central nervous system.

There is one question which still remains to be answered: Do these changes in the in vitro markers and the associated increase in monkey neurovirulence have any significance as regards the use of these vaccines in man? This question is probably of greater importance for the contacts than for the vaccinees. Will the altered strains excreted by the vaccinees undergo progressive changes after several passages in the community and eventually reach a degree of virulence comparable to that of wild polioviruses circulating in nature?

Although the vaccine has had its most extensive trial in the Soviet Union, where contact cases have not been reported, the problem of spread of reverted strains is potentially more serious in our country. In the Soviet society it appears possible to minimize the contact problem by saturating an entire community with vaccine. In our society, with the established personal relationships between patient and physician in private practice, mass feeding of vaccine is less likely to be adopted. Nevertheless, even under ideal circumstances of mass administration of the live vaccine, data are already available to show that mass immunization is not always an inevitable response. The reason for this has been discussed in this report; namely, that a certain and variable part of the community may carry other enteroviruses which interfere with "takes" from the vaccine virus. When the enterovirus infection ceases, such individuals are apt to pick up passage virus from a vaccinated person in the community. Thus for optimal safety, it is essential that the vaccine virus used does not revert toward increased neurovirulence in the course of human passage.

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Journal of Public Health

EDITORIALS

"Before the Storm" — The Fourth National Quarantine and Sanitary Convention, Boston, 1860

Just over a century ago—on June 14-16, 1860—there assembled in Boston, Mass., the Fourth National Quarantine and Sanitary Convention, last of a series of annual meetings which had as their purpose the promotion of sanitary science. The four volumes preserving the transactions of these conventions (Philadelphia, 1857; Baltimore, 1858; New York, 1859; Boston, 1860) are valuable documents in the history of American public health. These national sanitary conventions aimed at becoming a national public health association; though interrupted by the Civil War, they nevertheless led the way and were a milestone to this goal. A review of the 1860 convention is in order during this centennial year.

The year 1860 was crucial in the life of the United States; the stage was set for the great American tragedy. Several months after the Boston meeting, in November of 1860, Abraham Lincoln was elected 16th president of the nation, on a platform pledged to free soil and the gradual abolition of slavery. The crisis came to a peak shortly thereafter when South Carolina seceded from the Union, on December 20, 1860, and seized Fort Moultrie, Castle Pinckney, and the federal arsenal at Charleston. The secession of South Carolina was followed within two months by withdrawal of ten other southern states from the Union, and the organization of the Confederate States of America. The "War Between the States" broke out in April of 1861; that tragic strife and its lingering griefs are well known to all. Because of the outbreak of hostilities, a fifth quarantine and sanitary convention, planned for May of 1861, did not materialize and was never held.

In addition to the printed records of the 1857-1860 conventions, these meetings have been reviewed individually and collectively by modern scholars.[1-6] It is apparent that from these beginnings came the seeds of the present American Public Health Association, founded in 1872—in part by men who had attended one or more of the earlier conventions.

Patterned after the international Conférences Sanitaire held at Paris, France, in 1851 and 1852, the first three American quarantine and sanitary conventions were characterized by serious purpose and broadening scope. Organization, deliberation, and decision marked these

meetings. The published volume of the third gathering at New York City in 1859 contained a total of 728 pages! "The Proceedings and Debates of the Fourth National Quarantine and Sanitary Convention," held in the City of Boston, June 14, 15, and 16, 1860, reported for the City Council of Boston and printed by George C. Rand and Avery of that city, was a sturdy book of 288 pages.

Less vital business was transacted at the fourth convention than at the preceding ones. More than its predecessors, however, it was flavored with good fellowship and humor. Dr. Jacob Bigelow (1787-1879) of Boston was president. The largest representation, of course, was from Massachusetts. Of the southern cities, Baltimore, Savannah, and Memphis were represented — one delegate from each of the last two, and two from Baltimore. Eight of its 12 vice-presidents were physicians; the rest were various public officials. Of the 191 registered members, 118 were physicians; about the same ratio as the year before in New York. Like the earlier conventions, there was considerable cooperation between laymen and physicians—health leaders came from the ranks of both science and social reform.

Twelve committees were appointed, including one "On Arrangements for the Ensuing Year." Dr. John Ordronaux, young lawyer and physician, stirred up a heated debate by requesting a Committee on State Medicine. (Later in the convention, when Mayor Lincoln of Boston introduced Governor Banks of Massachusetts to the group, the governor said, "When doctors can agree as to the meaning of the phrase 'State Medicine,' may he administer it in gentle doses, that it may have the desired effect.") Other committees were named, On Hours of Labor, On the Nature and Sources of Miasmata, and so on. It is clear that the convention's field of concern had broadened considerably from its original purpose of formulating uniform quarantine laws.

On Saturday, May 16, the final day, "punctually at five o'clock," the members of the convention had dinner at the Revere House as guests of the Boston City Council. The mayor, governor, distinguished local physicians, and literary lights joined the delegates. Twenty-seven afterdinner speeches were made (there had been 14 in New York). The first toast was to "Sanitary Science—as illustrated and enforced by the Fourth National Convention of its Friends. May its fruits be for the 'healing of the nations.'" (The last phrase, from the Book of Revelation, chapter 22, verse 2, is the motto on the seal of the American Public Health Association.)

Dr. Bigelow reminded the group of its place in serious times—"Our lot is cast in a perilous age. . . . There are perils of nervous men and nervous communities. . . . For these evils, and many others yet unknown, we trust that the wisdom of future conventions will yet devise a remedy."

Dr. Oliver Wendell Holmes, litterateur and professor of anatomy at Harvard Medical School, read his poem of occasion, "For the Meeting of the National Sanitary Association, 1860." A quatrain lyric, it began, "What makes the Healing Art divine?" and closed with a masterly couplet:

> To guard is better than to heal,—
> The shield is nobler than the spear!

At the closing session of the convention, plans were made to hold the next meeting in Cincinnati, Ohio, "on Wednesday of the last week in May (1861), and that Dr. Mead of Cincinnati be chairman." The outbreak of war caused a fifth meeting to be postponed indefinitely, and the convention was never reassembled.

In his review of the four conventions, Cavins concluded: "The story of the Quarantine and Sanitary Conventions is

a story of origins. Like Peter Pan, the organization never grew up. But twelve years after its last meeting, four men who had attended one, two, or all of the four conventions met in New York with six other men and founded a new public health association. Three of its first five presidents were alumni of the old Conventions. To use a favorite allusion of Osler's, perhaps the Convention did the Phoenix trick, and, consumed by the fire of war, there arose out of its ashes the great American Public Health Association."

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The Journal is indebted to Dr. Fred B. Rogers, professor of preventive medicine, Temple University School of Medicine, Philadelphia, Pa., for the above editorial.

Do We Have Any Early Public Health Films?

DURING MARCH and April of this year, the National Library of Medicine presented an exhibit on "Pioneers of the Medical Motion Picture in the United States." This exhibit highlighted the activity of the library in its concern for the history of the medical motion picture. It is curious indeed that so little attention has been given to this subject. There is no definitive history or bibliography of the medical motion picture, and few of the early films are known to have survived the perils of projection, fire, and simple neglect.

The new building, now under construction for the National Library of Medicine, will be equipped so that individuals using the library may view films, just as books and periodicals are now used. In this connection the library has established an archive of medical films so that they may be preserved and also to provide a basis for research. The establishment of this central repository, it is hoped, will prevent or reduce any further loss of irreplaceable films and other materials. Furthermore, the library is collecting all published material on this subject and furnishes reference service concerning films. It would welcome any information on the location of prints of historical significance or other information on the early history of medical films.

The exhibit at the National Library of Medicine presented highlights in the careers of some pioneers of the medical motion picture, ending approximately with the year 1919, and the content was largely medical in a strict sense. Thus, the work of Borden, Carrel, Jacobson, and the Clinical Film Company was concerned with surgery. Chase and Weisenburg concerned themselves with nervous and mental disorders, Hamilton with pathological gaits, and other workers dealt with psychological and biological phenomena.

An exhibit of this kind almost inevitably raises questions in the mind of a public health worker: Do we have any early public health films? If so, where are they? Are unsuspected documents of this kind which would illuminate the history of public health hidden in closets, filing cabinets, desk drawers,

or other places? That such films were made is known. Lewis Jacobs in "The Rise of the American Film" refers to several. Information on such materials, their history and present location, if they still exist, would be most desirable. Our understanding of the development of various aspects of American public health, such as health education, community organization, or tuberculosis control, would undoubtedly be enriched by such means. The National Library of Medicine with its new facilities will be a very suitable repository for information and materials, and it is hoped that the library may provide a basis for the story of the film in public health.

Professional Education and Public Health in Latin America

THE REPORT of the Conference on Schools of Public Health in Latin America, published in this issue (p. 1039), is striking testimony of the maturity and capability of the Latin American schools of public health. While the conclusions relate particularly to the participating schools and the countries with which they are working, public health workers everywhere will recognize the universality of many of the principles and recommendations. Use of an effective seminar technic at the conference assured opportunity for all present to make significant contributions, and the final report shows this.

By the very nature of their aims and methods, individual schools of public health have great similarities in some respects and substantial differences in others. For example, the teaching of biostatistics or of microbiologic technics may vary in detail, but there is little reason for content to change. On the other hand, aspects of the curriculum dealing more directly with society and the specific community will differ considerably from one locality to another, and even more among the nations or regions of the world. Factors such as the prevalence of certain diseases, geographic conditions favoring particular vectors, medical traditions regarding vital statistics and recording of causes of death, community organization and governmental structure—all influence not only the content of instruction but, in some instances, affect the method as well.

Latin America represents an unusual combination of similarities and differences. When the United Nations established regional designations in the Americas, a variety of considerations—cultural, economic, social, as well as geographic—influenced the agreement to constitute three divisions: Northern America, including the U.S.A. and Canada; Middle America, which includes Mexico, Central America, Panama, and the Caribbean Area; and South America. The term Latin America is usually applied to Middle America and South America, comprising a total population estimated at 206,000,000 (1960), and including 20 republics, as well as the Netherlands Antilles and Surinam, three departments of France, and certain possessions of the United Kingdom.

Looked at as a whole, Latin America differs markedly from other parts of the world in certain characteristics. The land is in general sparsely settled even though some of the cities are crowded; the population is relatively young, both birth rate and mortality rate are high, and the rate of natural increase is the highest of any region of the world; and infectious diseases still constitute major health problems.

A factor of some importance is the degree of homogeneity which characterizes Latin America. Language is an outstanding example. Of the 20 countries, 18 speak Spanish; and the 67,000,000 inhabitants of one of the others, Brazil, speak Portuguese, which is suf-

ficiently like Spanish so that communication is not too difficult. Thus, with the exception of French-speaking Haiti, public health students of 19 countries may be interchanged without a serious language barrier. The same historical basis that determined language underlies many broad social, cultural, and religious similarities. In most of the countries the economy is mainly agricultural and the development of industry is relatively young.

To contrast with those factors tending toward uniformity there are many others emphasizing dissimilarity. Some countries are completely tropical, others are mountainous and cold, still others combine both characteristics. Variation in size is great; two countries have populations of about one million, 12 are under five million, one has sixty-seven million. All have great national pride and the number of international boundaries has heightened the problem of communicable disease control. Finally, the 20 republics have as many systems of public health organization.

Thus, the problem of adapting the teaching program to the needs of the countries which the schools are serving is a formidable task. The problem is complicated by the number of basic disciplines involved — medicine, nursing, engineering—to name but a few. For all these groups it is necessary to combine, in proper proportion, academic and practical components, as well as scholarly and vocational aspects.

University schools of public health have reached a more extensive development in the United States than almost anywhere else in the world, and the influence exerted by this process has been strong in the growth of schools of public health in Latin America. Nevertheless, these schools have by no means been blind followers of tradition; they have explored new ideas and new pathways in education. A step of obvious importance was to arrange for adequate exchange of ideas and comparisons of problems and accomplishments within the Latin American scene. The initiative of the Pan American Health Organization/World Health Organization in organizing and planning the conference which was based upon the collaboration of the government of Mexico, as well as the energetic participation of the several schools, has helped to produce a most useful document.

It is significant to note that the report ends with a section on standards for schools of public health. Effective standards, themselves shortly to be the subject of study by a WHO Expert Committee at Geneva, are potent weapons in the struggle to achieve the level of academic excellence and real leadership that a community has a right to demand of a school of public health.

The Journal is indebted to Dr. Myron Wegman, secretary general, Pan American Sanitary Bureau, Washington, D. C., and the chairman of the Editorial Board of this Journal, for the preparation of this editorial.

1960 Is the Golden Anniversary Volume
of the American Journal of Public Health

TO THE EDITOR:

The laudable endeavors of the Negro people in the United States to achieve full citizenship underscore the need for interested professional groups to provide them with adequate support.

It is clear that the Negroes themselves are tired of waiting for the millennial act of grace when prejudice will disappear. Nonviolent social action on their part gathers strength. Are we to be content to wait until there are sit-downs in health department offices and clinics, in hospital corridors and wards before we are shamed into acting according to the principles of our profession and clear evidence of our duty? Whatever excuse there may be for the businessmen who fear a loss of profit as their motivation for ending discrimination, what excuse is there for us? Are our ideals of public health in any way compatible with discriminatory practices?

No less than in other social aspects of discrimination against the Negro, do health services require positive action to eliminate such discrimination. There are striking disadvantages to the Negro population in the lack of or segregation of public health facilities and services in many places, a story about which a substantial literature exists. There are great obstacles to Negroes obtaining jobs equal to their true abilities in public health. In addition, professional training and funds and opportunities for training are inadequate under the discriminatory pattern prevalent in some states.

The APHA has been very cautious in joining battle against the specific aspects of discrimination in public health, although unquestionably sympathetic in general resolutions. (Its 1958 and 1956 resolutions favor full racial integration in health services.)

Overcaution now creates the risk of tolerating practices which will inevitably be attacked by the Negro people soon.

We strongly urge the Association to assert leadership and take effective steps to end discrimination in the field of public health. Our suggestions include:

1. Issue a Journal statement containing full information on the Association's policies and activities in the sphere of racial integration in health services. Rejection of discrimination as a pattern of public health service or professional employment should be spelled out by the Executive Board.

2. Urge regional and affiliated groups not to hold segregated meetings and to refuse to conform to discriminatory local practices.

3. Report (preferably in an early number of the Journal) the status of the analyses concerning racial integration and discrimination in public health, requested from the state affiliates, as described in the last year's Executive Board report to the Governing Council.

4. Request the Executive and Technical Development Board for clearer blueprints for future action for the Association in this regard.

5. Press for increased opportunities for training and employment at professional levels of Negroes in the field of public health.

6. Join with other professional groups (such as the AMA, ADA, AHA, ANA, and APWA) to work out a common policy and program to end discrimination nationally in health services. All major national health organizations should agree to issue statements in their official journals containing full information on their policies and activities in this sphere.

There may be other or better ways to proceed. Will not others write giving their views, either to the Journal or to other sources in the Association?

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To the Editor:

The paper on "Nutrition and Heart Disease," by Dr. Jean Mayer in the Supplement to the March, 1960, issue of the A.J.P.H. cites a follow-up study of patients with angina pectoris made at the Mayo Clinic. It was reported that the 5- and 10-year survival rates were higher for obese patients than for those of normal weight (Block, W. J.; Crumpacker, E. L.; Day, T. J.; and Gage, R. P. J.A.M.A. 150:259, 1952).

These reported results, however, cannot be taken at their face value. A review of the published data I made shortly after the paper appeared indicated that the obese group was quite select in that it excluded those with any other impairments which were considered in the analysis; the obese in such cases being classed with the other impairment. I judged that this was not the entire explanation and, accordingly, wrote to one of the authors. I was informed that the obese group included a significantly higher proportion of women than did the experience as a whole. It is also possible that the average age of the obese group was lower than that of the experience as a whole. I was further informed that it was planned to reanalyze the original data to correct these biases, but this was never done.

Earlier doubts as to the validity of this reported finding from the Mayo Clinic experience are reinforced by the recently published results of the "Build and Blood Pressure Study, 1959" by the Society of Actuaries.

The experience is based on nearly 5 million insured persons observed over periods up to 20 years. The results show unequivocally an increasing mortality from heart disease in general, and specifically from coronary disease, with increasing degree of overweight. The excess mortality from heart disease ranged as high as 85 per cent among the more obese males. In contrast, the mortality among male underweights from heart disease was about 20 per cent less than that of all standard risks, and the mortality from coronary disease was about 25 per cent less.

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PROFESSIONAL EDUCATION

CONFERENCE ON SCHOOLS OF PUBLIC HEALTH — Hacienda de San Miguel Regla, Huasca, Hidalgo, Mexico, November 2-7, 1959*

The importance of properly trained personnel for the planning of health services and for the improvement of health conditions is generally recognized. Hand in hand with this recognition goes the need to give wider attention to the educational problems of public health workers and to the objectives and functions of the institutions that train them. From time to time, therefore, as occasion warrants and appropriate materials are available, the Journal will publish a section on professional education. It is with great pleasure that we present the following report as the initial contribution of this section. While the report was produced by schools of public health in Latin America, anyone concerned with the professional education of public health personnel in the United States will find much of it applicable.

Introduction

LONG-RANGE improvement in health services depends upon availability of properly trained personnel for the various health professions. Graduate professional education in public health has been developing steadily in Latin America, and in 1959 established courses existed in São Paulo, Brazil, Santiago, Chile, Mexico City, and San Juan, Puerto Rico, to which students from other countries were admitted. Other schools with enrollment limited to national or state personnel existed or were being developed in Argentina, Brazil, Colombia, and Venezuela. Based upon the belief that the time was opportune for mutual exchange of ideas designed to improve standards and performance, the Pan American Sanitary Bureau, Regional Office of the World Health Organization, convened a Conference of Schools of Public Health which brought together persons responsible for teaching public health in Latin America.

The conference was prepared in advance with documentation, background material, and bibliographic references of previous meetings. Studies on professional education in public health were distributed to the participating institutions. A PASB/WHO consultant, Dr. Wilson G. Smillie, visited the schools of public health in Latin America to help them analyze their status and their chief existing problems. This information was used to formulate the agenda of the meeting. At the same time the consultant interviewed officers of the ministries of health to seek the "consumer's" point of view on the content and purpose of educational programs in the field of public health.

With the information available on the various schools and the data and suggestions obtained by the consultant, it was decided that the main topics to be discussed at this first meeting would be:

(a) Objectives of a school of public health
(b) Content and length of the teaching program and methodology
(c) Administrative procedures for the teaching, research, and service activities of a school of public health.

A list of questions to serve as a basis for discussion of the three main topics

* Published in Spanish in the Boletin de la Oficina Sanitaria Panamericana, XLVIII, 4:281 (Apr.), 1960.

was prepared and distributed well in advance among the participants. A paper* on "Schools of Public Health" was especially prepared for the occasion by a PASB/WHO adviser, Dr. James L. Troupin. This paper presented some basic concepts and was intended to stimulate thinking and discussion on different aspects of public health teaching.

The meeting took place in San Miguel Regla, State of Hidalgo, Mexico, November 2-7, 1959, with the generous collaboration of the government of Mexico.

Thirty-three participants attended the meeting, including educators and health administrators, from Argentina, Brazil, Chile, Mexico, Peru, Puerto Rico, United States, and Venezuela. Among the participants were physicians, engineers, health educators, statisticians, and members of other professional groups. Dr. Pedro Daniel Martínez, director of the School of Public Health in Mexico City, was unanimously chosen as chairman of the conference. Dr. Ramón Villarreal of the PASB staff had been designated as coordinator of the conference.

In the opening session, Dr. Abraham Horwitz, director of the Pan American Sanitary Bureau, addressed the participants. Dr. Horwitz outlined general principles of medical education, the reorientation that the teaching of medicine is accomplishing now by the incorporation of the concept of preventive medicine and its effect in the development of public health teaching. He also pointed out the need for more integrated teaching in the field of public health.

Dr. José Alvarez Amézquita, minister of health and welfare of Mexico, welcomed the participants and emphasized the importance of the work to be done at the conference. He noted the great variations in health and social conditions throughout Latin America and pointed out the great task involved in training the leaders in public health work.

The conference was planned as a group discussion meeting in which all members were expected to contribute to the deliberations through active participation, working in small groups of about ten participants. Participants were assigned to these groups with due care so as to achieve balanced professional and geographic distribution.

Each group appointed its own chairman and rapporteur for each topic to be discussed. A continuing secretary for each group had been previously assigned from among the PASB professional staff. Each topic was introduced at a plenary session through a panel presentation by three or four of the participants, drawing upon all three groups.

Following this the groups considered the questions under each topic in great detail. When the topic had been concluded the rapporteurs and secretaries met together to prepare a joint report that would reflect the opinions of all the groups. This joint report was then studied by each group separately and the resulting comments were subsequently examined in a plenary session. Corrected versions of the three main topics were thus prepared and assembled to be gone over completely once again at the last plenary session. The resultant Final Report appears on page 1041.

Noteworthy in the development of the work of the conference was the enthusiasm and dedication of all the participants. Scheduled time for the sessions was almost invariably exceeded and the long lunch period, traditional in Mexico, was shortened by continuing debate and discussion. Contributing also to the good results was the fact that the participants were all housed in the same hotel where the meeting took place and that this was in an isolated spot. In this way discussions usually continued in an informal way even when the scheduled daily sessions had finished.

The mutual stimulation of the sus-

* See footnote on p. 139.

tained contacts and the establishment of a basis for continuing interchange were probably the greatest success of the conference. The participants looked forward to an early renewal of these contacts and an exchange of information on the progress accomplished. The invitation of Venezuela, therefore, to hold a meeting in 1961 in Caracas was received with acclaim.

Final Report of the Conference

Objectives and Functions of a School of Public Health

The objective of a school of public health is to contribute to the improvement of health primarily through the training of members of the public health team in the various phases of their activities. In order to achieve this general purpose, the schools carry out the following basic functions:

A. Teaching
B. Research
C. Advice to public and private health agencies
D. Orientation of public health policy

Although at present priority is given to the teaching function, all the functions described should be developed jointly and harmoniously, depending upon local conditions and the resources each school of public health has available for its activities. The particular public health and socioeconomic conditions of a country do not affect the general purposes of a school of public health, but these conditions do influence the content and the nature of the teaching and the nature of the teaching personnel.

The *teaching* function is designed to develop in the students:

(a) Basic knowledge of the principles, theories, methods, and technics in the various aspects of health protection, promotion, restoration, and rehabilitation in order to enable them, working preferably as members of a team, to plan, execute, and evaluate the different health programs; understanding of the need, in planning, to make prior investigation of the nature and magnitude of public health problems and existing resources to meet them, as well as related community attitudes.

(b) Abilities and skills in applying these principles and methods to the study and the solution of problems most frequently found in practice.

(c) Attitudes which will help them learn how to serve their community, to improve themselves constantly, particularly through continuing study and research, and to work as a team in cultivating good human relationships — a point considered fundamental in the teaching process, as, in the final analysis, it determines success or failure in public health activities.

Important in the teaching process is emphasis on general principles that may be applied to any situation, through utilizing representative technics or demonstrations. The student needs to understand that it is not only inadvisable but obviously impossible to teach him all the solutions for each situation.

Research is essential, as it rounds out the school's teaching activity. When the research is of an applied nature, it brings the school's personnel and students into relationship with local problems and helps in solving them.

Advisory services consist in offering to public and private agencies, upon request, aid in the study and solution of specific health problems.

Orientation of the country's public health policy, as well as community attitudes in this respect, can be favorably influenced by the school's use of its prestige and resources to disseminate

sound ideas and scientific knowledge. This function is not to be confused with health education of the general public which is a responsibility of the health service.

Student Body

Schools of public health should assume continuing responsibility for training the members of the public health team who are at university level. Some schools believe that they are only temporarily responsible for training the rest of the team, that is, below the university level, until the health services themselves have developed institutions capable of assuming such training.

Selection of Students

In order to make a better selection of candidates for courses leading to the degree of master of public health or its equivalent, there must be an adequate number of applicants. The schools of public health should stimulate this through promotion among public health authorities and working personnel. Increase in number and quality of applications is encouraged when the public health authorities give recognition to the master's degree in public health when deciding on appointment or advancement, and when the schools themselves offer high-quality courses.

It is difficult to establish a single admission procedure as this will vary according to local conditions. At present the following different factors are generally taken into consideration:

(a) Age
(b) Prior experience
(c) Physical condition
(d) Intellectual ability and emotional maturity
(e) Motivation, sense of calling for the profession, and social conscience
(f) Post to be occupied by the candidate after graduation
(g) Desirability that the candidate be sponsored by a national or international organization
(h) Results of admission examinations.

With respect to prior experience, it was deemed difficult to establish fixed criteria, as elements of judgment are not yet available for effective determination. Hence it was recommended that the schools make an objective study of the matter and exchange information thereon. There was general concern with respect to older students and, while exceptions may be necessary in specific cases, it was recommended that, as a rule, the student ought not to be over 45 years of age. Likewise, it was thought that in general a minimum of two years of prior professional experience be required, preferably in health work.

In order to determine motivation, sense of calling for the profession and social conscience of the applicant, personal interviews are required. It was pointed out that effective personal interviews require experienced interviewers, and that such interviews, although not always providing all the information desired, do nevertheless provide certain data on the candidate that cannot be obtained by any other method.

There was unanimous opinion that the candidate's knowledge and preparation should be evaluated through an analysis of his record, rather than through an examination. The latter was considered inadvisable.

With reference to the selection of foreign students, the schools face a serious problem, since it is impossible for them to evaluate the candidates fully. It was thought that international agencies could be a good deal more helpful in this respect if, knowing the criteria of the schools, they used such criteria carefully in the preliminary selection of the candidates. It was also deemed advisable for the professors in the schools to have an opportunity during travel fellowships to orient international of-

ficials on the standards and methods of selection in effect in their respective schools and to assist in interviewing proposed candidates.

The selection process may be a joint activity between the institutions concerned and the school of public health, but the final decision is the responsibility of the school.

Teaching Program: Content and Scope

The teaching programs established in schools of public health should be carefully planned and evaluated to make them adaptable to the changing requirements that professional and technical personnel must meet in the different communities they serve. The various subjects should be arranged in logical sequence, beginning with a preliminary period of orientation for the students. In order that academic activities may be in keeping with the needs posed by health problems, it is advisable that the schools, in preparing their programs, maintain constant consultation with the public health agencies.

Any course for a master's degree in public health, or its equivalent, designed for physicians, should include the following subjects, considered essential:

Public Health Administration
Epidemiology
Sanitation
Statistics

The following subjects should be included in the teaching program, either in combination with the above or separately:

Social Sciences
Nutrition
Health Education
Maternal and Child Health
Microbiology
Parasitology

In addition, depending upon the resources, the needs of each school, and the particular conditions of each country, the following subjects, among others, may be included in the curriculum:

Hospital Administration
Medical Care
Industrial Hygiene
Mental Health

In the opinion of some participants these last subjects are just as essential as the subjects listed in the second group and should be taught in all public health courses.

It was pointed out that the present role of the public health nurse is so important in public health administration that this subject should include teaching of public health nursing. It was also noted that public health administration should include elements of public administration, although some participants were of the opinion that the latter merits a separate course.

Consideration should be given to the possibility of offering elective subjects, taking into account the following factors: importance of the problems represented in these subjects in the area served by the school; availability of teachers; the number, capacity, and interest of students who would take the course.

As distinct from individual elective subjects, students may, depending upon their interests, the needs of the services for which they are being prepared and the resources of the schools, be offered an opportunity in the final part of the course to concentrate in certain broad fields of great importance in public health, such as epidemiology, maternal and child health, or hospital administration. This should be clearly distinguished, however, from true specialization in a given field which requires a longer period of studies.

With reference to the length of the course for a master's degree in public health, the consensus was that it should not exceed one academic year. It was recognized, however, that there are some

factors tending toward an increase in this period, such as: defects and gaps in the medical and general basic training of the students; the need for more time to cover the teaching program satisfactorily; and insufficient prior experience on the part of the students. As against such factors there are others that make it necessary, for the time being, to limit the period to one year. Some of those factors are: present scarcity of public health experts; high cost of education; limited educational resources; and the fact that the longer a student is in school the longer he is kept from his regular work.

Teaching Methods

It was recommended that in order to derive greater benefit from program content, active teaching methods should be greatly expanded. Consequently it was thought advisable to reduce to a reasonable minimum such didactic instruction as is needed to provide the student with systematic information. On the other hand, much greater use should be made of certain teaching methods, notably seminars, laboratory work, bibliographic studies, field work, and organized group discussions. It is advisable to use in these exercises any local material likely to arouse greater student interest. Resources of the schools in teaching materials may be enriched by a system of interchange; establishment of such a system was recommended.

To achieve integration of teaching where feasible, emphasis was laid on the need to design pedagogical units comprising subjects taught by professors of various disciplines. By the same token, an endeavor should be made to focus teaching on topics of direct interest and on student participation in matters of live concern to the community. In order to maintain such integration, it is essential for the teaching personnel to meet frequently and regularly.

Other means mentioned to improve academic performance include: distributing outlines of the topics to be discussed, supplying bibliographic reference lists, obtaining books and other materials in Spanish or Portuguese adapted to conditions in Latin America. Lack of these is a serious problem, since only a minority of the students are able to read other languages. Furthermore, translations of American or European books are not completely appropriate for prevailing conditions in Latin America.

Since this is a problem that urgently requires a solution, it was suggested that the Pan American Sanitary Bureau, in cooperation with other international agencies, study means of promoting production, translation, and distribution of publications that are adapted to the specific needs of Latin American countries.

Field Work

Despite difficulties of providing field work, such work constitutes a valuable educational process whose objective is to provide the student with an opportunity to observe and, if possible, to participate in the practical application of the principles learned. In order for field work to produce the expected results, the following conditions are essential:

Proper planning by the school—sufficiently in advance and jointly with the persons responsible in the field; prior explanation to the students as to what it is intended to demonstrate; work in small groups; close, direct, and continuous supervision by the school itself; and presentation by the students of a report on their field work and discussion of their experiences either on the scene or in the school of public health, in the presence of the supervisors and, as far as possible, of the directors of the field offices where the work was done.

An endeavor should be made to have

the students suggest solutions for the problems encountered.

Field work is a primary responsibility of the school, with collaboration of field center personnel. As far as possible, it is desirable that the professor take part in this type of activity. In view of the importance of supervision for the success of field work, it was suggested that persons in charge of it be properly prepared by the school for this activity.

Thesis

Recognizing time limitations but noting the advisability of stimulating development of creative attitudes and abilities relating to the study and solution of problems, it was recommended that the traditional academic thesis be replaced by a more modest study of a concrete situation within the capacity of the students and which they could do individually or collectively. It was thought advisable that the following conditions should be met:

That the topic represent a true learning experience, one that the student might face in actual practice and one which will give him an opportunity to become familiar with all phases of an investigation;

That the selection of the topic be made with the advice of the school's teaching body, which also should direct and supervise the study;

That the study represent a contribution to the service where it is carried out; and

That it be possible to carry out the study properly within the time available during the course.

Adaptation of Teaching Program for Nonmedical Students—Combined Courses

To make the basic study program applicable to nonmedical students, the first need is to plan the content in order of importance, with division into two main parts, one general, basic, and the other specific for each professional group.

It was pointed out that there are advantages to bringing persons from various professions together wherever combined instruction may be effectively carried out, particularly in the basic part of the course. It was also noted that the seminar technic lends itself to this kind of instruction.

Among the advantages of such combined courses, the following were mentioned: conditions are created which are basic to stimulating learning how to work together as a team; mutual understanding and establishment of criteria useful in public health are facilitated; an opportunity is provided to exchange experiences; and better training of teaching personnel is stimulated.

Among the disadvantages that this type of course needs to overcome, the following were mentioned: limitations are imposed by the unequal preparation of the students, particularly as they go into the various subjects more deeply; and problems of adaptation appear among the students and among the teachers.

Some of the participants expressed reservations with respect to the possibility of having combined courses for students at different educational levels, in such subjects as public health administration, statistics, and epidemiology.

Evaluation

How to use oral and written examinations to evaluate the progress made by students is a universal problem that has not been satisfactorily solved in any school. The difficulty rests on the following facts:

(a) The evaluation needs to be at the postgraduate level
(b) Students often occupy important positions in their own communities
(c) Evaluation needs to be consistent with the principle of integrated teaching

(d) Proper evaluation involves not only knowledge, but also attitudes, abilities, and personality traits, which are difficult to weigh.

In consideration of these difficulties and in view of the need to use some evaluation method to stimulate the student to learn, it was recommended that the process of evaluation be continuous throughout the entire academic period by means of an appraisal of laboratory work, group work, seminars, field work, and various types of exercises and reports.

Both partial and over-all examinations should be given, aimed at evaluating the attitudes and knowledge acquired during the course. To that end, it was pointed out that oral examinations given in the traditional form do not by themselves fulfill the objectives sought by the evaluation process.

Furthermore, it was urged that the professors should have a clear idea of the purpose of the evaluation measures and be aware of the limitations of the results, which measure not only the student but also the teaching body and their teaching methods.

Teaching Body

The teaching body should be composed of:

(a) Full-time teaching personnel
(b) Part-time teaching personnel
(c) Collaborators and visiting professors

It was recommended that the professors of essential subjects be full time.

It is advisable that the part-time personnel come from health services collaborating with the school. From this group of teachers it will be possible to select those who are outstanding because of their devotion, interest in teaching, or experience, and to encourage them so that at a later date they may join the full-time staff.

The school may also choose teaching personnel from among the students who have done best in their courses.

Participation of visiting professors and collaborators from the field is useful when there is time to plan their teaching responsibilities carefully and when they are provided with an outline of the course so that their instruction will fit properly into the course objectives.

It is advisable that, as a minimum, the regular personnel responsible for teaching meet the following requirements:

(a) Real interest in teaching
(b) Adequate academic knowledge and field experience at the different public health levels, along with capacity to carry out research
(c) Ability to impart their knowledge and experience
(d) Knowledge of the principles of learning and skill in teaching method
(e) Knowledge of the objectives and functions of the school and, if possible, knowledge of the services and of the health, socioeconomic, and cultural conditions in the countries of origin of the students
(f) A broad, general cultural background
(g) If possible, possession of a master's degree in public health, or its equivalent.

Through inservice training courses, seminars, lectures, and study travel the school should provide teaching personnel with facilities for professional improvement, encourage them to carry out research, and help them increase their teaching ability.

It is clearly desirable to set up plans for exchange of professors among the schools.

It was deemed inadvisable, and essentially impossible, to apportion rigidly the time to be devoted by the teaching staff to research, teaching, and advisory activities, but these three functions should be in such proportion as is consistent with the economic, administrative, and personnel resources of the school.

Premises and Equipment

Every school needs its own premises, adequate for the purpose and equipped with laboratories, library, auditorium, and sufficient offices for the different departments, as well as rooms for seminars and classes.

Equipment for the various laboratories, notably microbiology, parasitology, statistics, and sanitary engineering, will be needed both for student exercises and for research, which often requires specialized apparatus. It was suggested that particularly in view of the high cost of laboratory equipment, consideration might be given to a laboratory of polyvalent type. Such a laboratory in turn, could be a factor in helping to coordinate teaching.

The library should be centralized and accessible to all students with a properly trained person in charge. It is essential that there be available sufficient copies of reference publications for simultaneous use by students taking different courses. Schools can help each other through exchange of national publications.

Mention was also made of the importance of adequate provisions for transportation when related to instruction, secretarial supplies and equipment, audiovisual aids, equipment for collecting specimens, and equipment for printing bibliographic material.

Training Areas

Schools of public health should use the community as a laboratory in training professional personnel, by means of visits for observation purposes, practice periods, tests of technics, studies of programs and investigations under way, the provision of advisory services, and direct services to the community.

There are two types of training areas, one under the school itself and the other belonging to the public health services; the one does not exclude the other. On the contrary, either can meet the teaching needs quite satisfactorily provided there is a clear understanding as to the utilization of the center as a practice field for observation, interpretation, and research.

It was recommended that cooperation between schools and services be achieved through written agreements stipulating the bases agreed upon and the benefits that both parties may expect.

The advantages to a school of public health of having a training area are: Students may observe more easily the application of the principles and technics taught them; it is more feasible to establish in the area certain basic standards that will insure a better environment for practical training; an area that does high quality work is an example for the other services of the countries; and such an area offers a more suitable environment in which the teaching body can carry out research activities.

The disadvantages of a demonstration area are: It can create an artificial situation that may not be representative of the country's organization; the area personnel are generally more numerous and better paid than that of the rest of the local services so that the administrative experience of the area is not always applicable in other places; and other services in the country may, at times, become antagonistic to the demonstration center since they have similar service responsibilities but do not have the advantages which are mentioned above.

A training area should: be representative of actual social and health conditions in the country or region; offer a polyvalent and integrated public health program; have well qualified personnel in sufficient number who, in one way or another, form part of the teaching body of the school and receive payment from the school; and maintain constant contact with the school.

In the use of the center it was pointed out that too heavy a load of observation visits to demonstration areas may bring about difficulties for all concerned.

In order to provide more characteristic surroundings for the student, it becomes necessary to use in addition to designated training centers, other areas that are representative of various types of actual local conditions, including areas that are underdeveloped with respect to health.

In considering the benefits that a community may obtain by having its services used for instruction, it was recognized that any teaching process carried out in a locality improves the level of medical care and, consequently, the quality of service rendered to a community. The advisory services given to programs, the information produced by research, the testing of new technics and methods, the increased prestige of the personnel involved, all redound to the benefit of the community served by such service. Moreover, since the schools each year train more personnel for local work, local services are strengthened by having better prepared staff.

Financing

A school of public health is an expensive undertaking and its maintenance must be achieved basically through public funds adequate in quantity and allocated in a special and independent budget which permits flexibility in management. In addition to such resources there may be others derived from international and special agreements that make provisions for personnel, consultants, fellowships for faculty members, equipment and supplies. Furthermore, the collection of tuition fees from students, particularly foreign students, is another source of income. It was deemed necessary for international agencies sending foreign students to the schools to pay the full cost of training these students.

With respect to financing research activities, two sources were listed: the school's own budget, and donations from private individuals and from institutions, public and private, national and international.

Health services can also fill an important responsibility by contributing to the financing of practice areas, by facilitating participation of their employees in the educational programs, and by encouraging them to enroll in the public health courses.

Relationships with Other Schools

Since the students in schools of public health are graduates of other professional schools, the former schools should orient the latter in matters pertaining to the study of public health problems. Interrelationship should be established through joint study of problems of mutual interest and through good lines of communication between the members of the respective faculties. In order to achieve this, it is essential that the school of public health keep in touch with the thinking of other schools providing professional training. To do so, it is advisable that schools of public health be part of a university or have close relations with one. Being part of a university can carry with it autonomy of internal administration, prestige, stability, faculty of university caliber, the right to grant university degrees, and a greater possibility of close relationships with other university schools or research centers.

Collaboration of a school of public health with other institutions is useful in developing teaching and investigation programs; in turn, the other institutions strengthen the educational capacity of the school of public health by collaborating with it, mainly in special or elective courses.

Utilization of Graduates

The institutions that employ or use the services of graduates of schools of public health may make better use of them by: placing the graduates in adequate posts with progressive responsibility according to their experience and training; planning for quantitative and qualitative personnel needs well in advance, and advising the schools of these needs so that the schools can adjust their training programs accordingly; evaluating and discussing with the school the services provided by their graduates; promoting regular meetings for personnel of the services and of the school; providing support for research activities.

From all points of view, it is to be recommended that an individual who has received so long and costly a training should be used in responsible posts, whether in service, teaching or research, or any combination thereof. Students who are already employed should be assured that after the course in the school of public health they may return to at least the same post they had held.

In the case of foreign students, the national agencies must faithfully respect the commitments given by their governments to the organizations awarding fellowships, that, on return, these fellows will have a suitable public health post.

Public Health Career

The main responsibility for making public health a career falls upon the ministry of public health. Schools of public health, however, can cooperate in establishing and strengthening such careers by improving their work methods and leading the way because of their efficiency and scientific and moral prestige. In this way the schools will have higher standing and their diplomas will carry more weight in competitive entrance examinations and promotion.

The school is in a position to advise on laws and regulations for the establishment of a career service that will insure stability in tenure and adequate income to full-time personnel.

Standards

Great concern was shown for the need to establish standards that, in the opinion of the conference, would make it possible to classify an institution as a school of public health. Among these standards would be the following:

(a) The institution should conduct regular courses for the master's degree in public health, or its equivalent, with the characteristics recommended in this report.

(b) It should have an adequate and independent budget, with administrative flexibility and free from unwarranted interference.

(c) It should serve a national or international area that justifies its existence.

(d) It should have an adequately trained staff, working on a full-time basis, at least in the basic subjects.

(e) It should have its own premises, properly equipped for teaching and research, including an adequate library and sufficient laboratories.

(f) It should have selected centers available for practical training.

It was decided to invite the Pan American Sanitary Bureau to consider making a study of this important matter.

Special Notes

Future Meetings

It was deemed gratifying that the Pan American Sanitary Bureau had considered holding another conference on Latin American Schools of Public Health in 1961.

An invitation on behalf of the Venezuelan government to hold this conference at Caracas, Venezuela, was received with acclaim.

It was further recommended that meetings of this nature be held periodically.

Obtaining the Services of Teachers

In view of the great scarcity of teachers in almost all the schools of public health in Latin America, the Pan American Sanitary Bureau was requested to study the problem of finding ways to assist the schools in this matter.

Appendix I—Conference on Schools of Public Health

Questions used as guide for discussion:

A. Objectives of a School of Public Health
   1. What are the objectives of the professional education program in a school of public health?
      (a) in respect to the preparation of professional public health workers?
      (b) in respect to the school's research program?
      (c) in respect to service to the community?
   2. In what way are these objectives influenced by the public health and socio-economic conditions of the countries?
   3. How can the objectives of schools of public health be related to the objectives of other training institutions in the health field?
   4. What type of persons should be trained in a school of public health?

B. Content and Coverage of the Course; Teaching Methods; Faculty
   1. With regard to physicians taking the M.P.H. course or its equivalent:
      (a) what essential courses should the curriculum include?
      (b) what elective courses should be offered?
      (c) how long should this course be?
      (d) what teaching facilities and methods will aid the students to draw the greatest possible advantage from the teaching program?
   2. What orientation should be given to the curriculum to make it applicable to students other than physicians?
   3. What courses may be given jointly to groups including students from different fields, for example, physicians, nurses and engineers?
   4. How should field work and field visits be best organized to offer the student maximum opportunity for learning?
      (a) short demonstration visits
      (b) practical field work
   5. What role should field work and field observations play in the curriculum?
   6. Who should be administratively responsible for field visits and practical field work?
   7. What methods may be utilized to evaluate the academic accomplishment of the students?
   8. What are the advantages of having students carry out a project resulting in a thesis, before graduation?

C. Administrative Standards for Teaching and for Community Service
   1. What policy should be followed regarding admission of students to a public health school and what methods and procedures should be used to apply this policy?
   2. Who should compose the teaching staff of the school of public health and how should this staff be prepared for its duties?
   3. How much time should the faculty of the school of public health devote to teaching activities and to research?
   4. What are the needs for equipment in a school of public health?
      (a) for teaching?
      (b) for research?
   5. How can a school of public health best use existing local public facilities?
   6. What standards should apply in the establishment, organization, and functioning of a training center?
   7. How can schools of public health utilize the community itself as a laboratory for observation and study?
   8. What benefit may the community obtain through having its services used for teaching?
   9. How should the activities of a school of public health be financed?
      (a) in respect to teaching?
      (b) in respect to research?
   10. How can a school of public health collaborate in establishment or strength-

ening of a career public health service?

11. What responsibility do the various types of health and related agencies have in helping to improve teaching in schools of public health?
12. What measures should be taken by the "consumers," i.e., agencies employing of graduates of schools of public health, to make better use of these graduates?
13. What are the advantages and disadvantages of assuring a student an official position in a health agency or in a school of public health upon satisfactory termination of his studies?
14. Should the health ministries participate in selection of students or should it be an exclusive function of the school of public health?

Appendix II—Conference on Schools of Public Health

List of Participants

Antúnes, Paulo C. A. (Brazil)
Armijo, Rolando (Chile)
Arreaza Guzmán, Alfredo (Venezuela)
Biaggi, Nelson (USA-Puerto Rico)
Campos Mendes, Marino (Brazil)
Candebat, Honorio (Argentina)
Castillo, Jorge (PAHO/WHO)
Coll, José (Argentina)
Coutinho, José de Oliveiro (Brazil)
Cutler, John C. (USA)
Díaz Coller, Carlos (Mexico)
Galvão, Augusto L. Ayrosa de (Brazil)
García, Victoria (Chile)
Grzegorzewski, Edward (USA-Puerto Rico)
Hinman, E. Harold (U.S.A.)
Horine, Emmett F. (PAHO/WHO)
León Ugarte, Mario (Peru)
Lópes, Cid Ferreira (Brazil)
López Ferrer, Daniel (Mexico)
Manrique de Lara, R. (PAHO/WHO)
Martínez, Pedro Daniel (Mexico)
Mascarenhas, Rodolfo do Santos (Brazil)
Neri, Rolando (Mexico)
Nuñez Calderón, Fernando (Venezuela)
Osuna, Aníbal (Venezuela)
Sánchez Meana, Luis (USA-Puerto Rico)
Sarué, H. Eduardo (PAHO/WHO)
Sevlever, David (Argentina)
Smillie, Wilson G. (PAHO/WHO consult.)
Troupin, James L. (PAHO/WHO consult.)
Urzúa, Hernán, (Chile)
Villarreal, Ramón (PAHO/WHO)
Wegman, Myron E. (PAHO/WHO)

ASSOCIATION NEWS

APHA ANNUAL MEETINGS

1960—October 31-November 4—San Francisco, Calif.
1961—November 13-November 17—Detroit, Mich.

A Silhouette of the 88th

Section secretaries have advised the APHA staff that arrangements have been made between two or more sections for joint sessions on the following topics at the Annual Meeting in San Francisco, October 31-November 4:

Genetics—Present-Day Concepts and Practical Application to Public Health
Rehabilitation of the Handicapped
Adolescent Development and Problems
Medical Care of Children in Public Programs
Guidelines to Dental Health Programs for Children
The Planning, Interpretation and Administration of Medical Care by Official Health Agencies
Recent Developments in Medical Group Practice
Services to Patients in their Homes
Occupational Health Service in Medical Care
Mental Health Services in Schools
The Statistician's Role in the Health Departments of the Future
The Air We Breathe
Cardiovascular and Chronic Disease Problems
Poliomyelitis and Polio Vaccines
Environmental Health for Institutions
Water and Waste
Radiological Health
Food Protection
Epidemiological Aspects of Health Education
Evaluation of Community Mental Health Programs
A Discussion of the Consultation Process with Special Reference to Mental Health Problems
Communication Problems Between Disciplines in Public Health
The Eye Health of Children
Controlled Photosynthesis and Public Health
Current Status of Noise as a Health Problem
Public Health Aspects of Agricultural Chemicals
Zoonosis and Comparative Epidemiology

Some of the topics chosen by the individual sections for their sessions are:

What's New in Dental Research?
Topical Fluoride Evaluation
Chronic Pulmonary Histoplasmosis in Sanatoria
Present Status of Food Additives and Implications for the Future
Current Issues in the Use of Drugs in Medical Care Programs
Comprehensive Psychiatric Care in the Community
Future of Generalist in Public Health Nursing
Cardiovascular Problems of Children
Local Implementation of the White House Conference Recommendations

Association Symposia, Monday morning and Friday morning, deal respectively with man and his changing environment and with cancer.

N.B.: It is not too early to make room reservations at San Francisco hotels for the Annual Meeting. (See reservation request form in Association News.) For points West of San Francisco: Members should have by this time received a detailed itinerary and program for the Pan-Pacific Health Conference to be held in Honolulu November 5-13, 1960. Hawaii is popular year-round, so the same N.B. applies for that conference, too.

Sibling Societies in Public Health

The Executive Director, Berwyn F. Mattison, M.D., accepted the gracious invitation of the Royal Society of Health (of which he is an Honorary Fellow) to take part in the opening of its Annual

Congress held this year in Torquay, England (April 25-29). His visit there immediately preceded his attendance as a member of the United States delegation to the 13th World Health Assembly at Geneva.

Some of Dr. Mattison's observations of the Royal Society Congress set forth below, serve to point up how both similar and different the two organizations are in their annual meetings and organization patterns. Many members of APHA, it should be noted here, are also members of RSH.

No business is transacted at RSH's annual "congress." The Council of the Royal Society of Health meets separately for that. The council consists of president, 28 executive vice-presidents, the treasurer, 25 elective councilors, and the secretary.

The chairman of the Elective Council is the equivalent of the APHA president. This post is now held by William G. Senior, CBE, Ph.D., who, with P. Arthur Wells, M.A., secretary, RSH, expects to be at the 88th Annual Meeting of APHA in San Francisco this year. Dr. Senior is the first dentist to lead the society. The presidency of the society is an honorary post, this year held by Lord Cohen of Birkenhead.

The chairman of the congress, Lord Morrison of Lambeth, at the 1960 meeting, officiates only at the meeting, having no formal ties with society affairs for the remainder of his term of office.

The society has a multidisciplinary membership, much the same as APHA's, with the exception of public health nurses who have their own organization which meets concurrently with the congress, as one of APHA's "related organizations" would.

RSH has more general sessions at its annual congress than APHA does. Each of these usually has three speakers and three persons prepared to discuss the papers. There appears to be a tradition of little audience participation.

Delegates "from overseas" numbered 95 from over 20 sovereign states and an approximately equal number of nations, dominions and colonies of the British Commonwealth, all five continents being represented. These "registrants" as well as those from government departments of Great Britain, from "municipal authorities, universities, societies, etc." (a very long list) and the Fellows, members, associates and affiliates attending the meeting (a relatively short list) have "appointments" to the congress. Most of these must also be known to RSH some time before the congress begins, for they are listed in its WHO's WHO and Health Exhibition Catalogue, which even contains a list of "late appointments." In all, some 3,300 delegates assembled at Torquay. For them, approximately 90 scientific and technical exhibitors set up 70 "stands" and numerous "wall displays." At an Annual Meeting of APHA the average is 200 exhibits.

In his brief address to the society, Dr. Mattison emphasized the similarities of APHA and RSH in their basic concern "about such things as radiologic health, atmospheric pollution control, recruitment and training of public health workers, chronic disease and accident control," all of which were subjects of sessions at the 1960 RSH Congress. "These seem much the same on either side of the sea (and present a complex) far different from the pattern of our responsibilities in the past."

Dr. Mattison also visited the headquarters of RSH in London, located just opposite Victoria Station. The central offices include a reference and lending library of some 30,000 volumes and a Health Exhibition Centre.

One More Supplement for 1960

An American Journal of Public Health supplement on the Epidemiology of Cardiovascular Disease will reach

readers with the October issue of the Journal. This will join the "Prevention and Control of Heart Disease" (March) and "International Health" (June) as the third dividend declared for Journal readers in 1960.

(Editor's Note: Supplements carry the designation

Prepared in Two Parts
Part II

Many readers were confused by this heading as it appeared in the March issue. Several drew the conclusion that the supplement itself was in two parts, and wrote in for Part I of the supplement. "Prepared In Two Parts" refers to the March issue—"Part II" is the supplement. In future the designation will be more clearly shown. Apologies meanwhile for our apparent, unintentional miscuing.)

APHA Engineering Associate Honored

The U.S.A. Section of the Inter-American Association of Sanitary Engineering (the Spanish abbreviation AIDIS is used) has bestowed its 1958 Western Hemisphere Award on Francis B. Elder, engineering associate of the APHA central headquarters staff. Announcement of Mr. Elder's honors was made at the annual meeting of the American Water Works Association at Bal Harbour (Fla.) in May.

The officers and members of the Section salute Mr. Elder and bestow on him their highest award "with affection and pride. . . . Throughout the years Mr. Elder has given generously of his time and talents in strengthening the U.S.A. Section so that it might participate effectively in the promotion of international sanitation programs." Cited also is the conscientious devotion of Mr. Elder's services as secretary of the Section and his ever-ready aid and prestige in furthering the objectives of the U.S.A. Section of AIDIS.

In bestowing the award AIDIS noted that Mr. Elder's professional affiliation with APHA had "provided unusual opportunities to . . . conduct affairs of the U.S.A. Section under the most distinguished circumstances."

Two Distinguished Retirees

One who is Past-President (1947-1948) of APHA, a 1948 Lasker Award Winner, the Sedgwick Memorial Medalist in 1958, and latterly the chairman of APHA's Technical Development Board may retire in the technical sense. Figuratively, however, the public health profession will not allow her becoming professor emerita of maternal and child health at Harvard to keep it from beating a path to her tower of wisdom.

Martha May Eliot, M.D., became that emerita professor on July 1. Her distinguished colleague, Bertha Shapley Burke, a Fellow of APHA and on the Harvard faculty since 1932, joined her in that academic rank on the same date as professor of maternal and child nutrition emerita. Among the honors she has received is the 1945 Borden Award of the American Home Economics Association for outstanding research in applied nutrition.

APHA Project Staff Honored

At its 1960 annual meeting the Medical Society of North Carolina gave its Moore County Award to Robert E. Coker, Jr., M.D., Norman Miller, Ph.D., Thomas G. Donnelly, Ph.D., and Kurt W. Back, Ph.D., of the Department of Public Health Administration, University of North Carolina School of Public Health at Chapel Hill. Title of the "best all-round scientific paper" presented at the society's 1959 meeting is "The Medical Student, Specialization and General Practice." The authors are staff for the joint APHA-University of North Carolina project which is studying

the reasons medical students choose specialties, especially public health. (Dr. Back has recently joined the faculty of Duke University.)

Dr. Coker and his co-authors identify some of the differences between medical students going into specialties and into general practice. Of the study population, "those choosing general practice are more likely to have less financial resources, are more likely to come from small towns or rural areas and to want to return to similar areas, expect smaller incomes, are likely to be older when they enter medical school, are more interested in close personal relationships with patients, less interested in high status, more interested in helping people but less interested in utilizing highly developed skills or making a contribution to knowledge." They add, however, that this does not imply that either those interested in general practice or those interested in specializing are lacking in any of these favorable attributes or are overburdened with any of the unfavorable ones. "We have simply compared the degree to which these qualities occur in the two groups." They point out, too, that the data concern students' current plans for the future: "internships, residency or the ever-present military service . . . may change their views."

The authors expect that further analysis of data will reveal physicians' motivation in selecting particular types of practice or particular locations.

The article appears in the North Carolina Medical Journal: 21,3: 96-101, 1960, and reprints will be available.

Hospital Listing Standards Changed

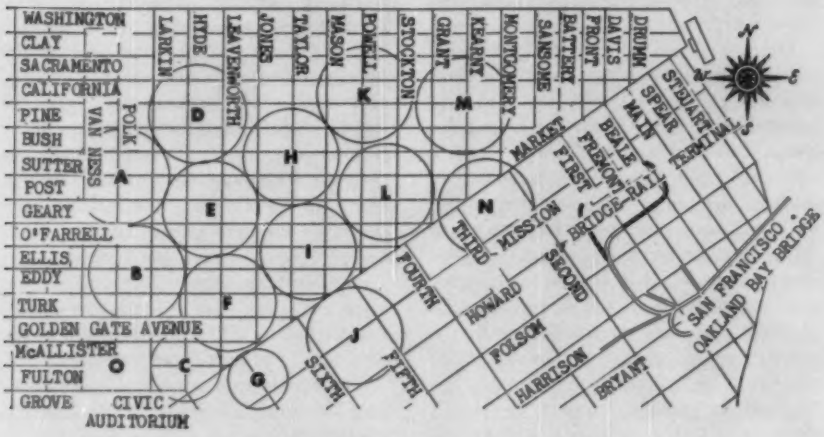
In an attempt to insure higher standards of medical care, the American Hospital Association will drop from its listing any of its member hospitals which after December 31, 1960, employs graduates of foreign medical schools not certified by the Educational Council for Foreign Medical Graduates. The council, formed in 1957, is sponsored by the AHA, the American Medical Association, the Association of American Medical Colleges, and the Federation of State Medical Boards of the United States.

AHA's ruling follows close upon that of the AMA which, after July 1, will withdraw its approval of internship and residency programs at those hospitals in which any foreign appointee does not meet the following requirements: has an unrestricted state license to practice, is in his final six months of training, has full or temporary certification from the Educational Council, or has been given a six-month appointment contingent upon passing the council's examination to be given in September.

AHA's listing program is a census of the country's hospitals that meet specific requirements. It is not intended as a measure of quality of care. The teeth in the AHA ruling: a hospital's listing is its first prerequisite for accreditation by the Joint Commission on Accreditation of Hospitals. Thus a hospital losing its listing in the American Hospital Association automatically loses its accreditation.

More than 4,000 graduates of medical schools in other countries have been certified by the council. Puerto Rican and Canadian graduates are considered as graduates of American schools.

Street Plan of San Francisco Showing Location of Civic Auditorium and Housing Bureau Hotels (Letter indicates Zone)



HOTELS AND RATES

Zone	Hotel	Single	Double	Twin Beds	Parlor Suite
E	Alexander Hamilton	$10.00–14.50	$13.00–18.50	$13.00–18.50	$30.00–60.00
H	Bellevue	8.00–10.00	10.00–12.00	12.00–15.00	20.00–25.00
L	Beresford	4.75– 5.50	6.00– 6.75	6.50– 7.00	
M	Beverly Plaza	7.00– 8.00	10.00–11.00	10.00–12.00	20.00–
A	Broadmoor	7.00–	8.00–	10.00–	
I	Californian	8.50–11.00	10.50–13.50	11.50–14.00	22.00–25.00
H	Canterbury	10.00–17.00	12.00–19.00	14.00–20.00	25.00–40.00
L	Cartwright	6.50–	7.50–	8.50–	
H	Cecil	7.50– 8.50	9.50–10.50	11.00–12.00	
L	Chancellor	7.00–	9.00–	10.00–	
H	Clift	13.00–21.00		16.00–23.00	41.00–50.00
K	Colonial	8.00–12.00	12.00–15.00	15.00–20.00	20.00–25.00
H	Commodore	6.00–12.00	8.00–14.00	10.00–16.00	
L	Devonshire	6.00– 6.50	7.50– 8.50	8.50–10.00	
L	Drake Wiltshire	10.00–11.00	12.00–14.00	13.00–16.00	25.00–35.00
H	El Cortez	8.00–10.00	10.00–12.00	11.00–14.00	20.00–26.00
F	Federal	3.00– 5.50	4.00– 7.00	4.50– 7.00	
L	Fielding	6.00– 8.00	8.00–10.00	9.00–12.00	20.00–25.00
L	Franciscan	7.00–	9.00–	12.00–	18.00–
H	Gaylord	8.00–	10.00–	12.00–	25.00–
L	Golden State	5.00– 6.00	7.00– 8.00	8.50– 9.00	
K	Grant	5.50–	8.00–	9.00–	
A	Jack Tar	10.00–20.00	12.00–22.00	16.00–26.00	32.00–80.00
L	King George	6.00– 8.00	8.00–10.00	10.00–14.00	20.00–
J	Lankershim	4.00– 5.50	5.00– 7.00	6.50– 8.00	
F	La Salle	6.00–	7.00–	8.00–	15.00–
A	Leland	4.00– 6.50	5.00– 8.50	7.00–10.00	
L	Manx	8.00–11.00	10.00–12.00	11.00–13.00	20.00–25.00
K	Mark Hopkins	15.00–19.00	19.00–23.00	19.00–23.00	38.00–75.00
H	Maurice	6.00– 9.00	8.50–10.50	9.00–11.50	17.50–18.50
I	Olympic	5.50– 8.50	7.50–11.00	8.50–10.00	
I	Oxford	7.00– 8.00	8.00– 9.00	9.00–10.00	
L	Paisley	5.00–	6.50–	7.00–	
J	Pickwick	5.00– 7.00	6.00– 9.00	6.00– 9.00	
L	Plaza	7.50–11.50	9.50–13.50	10.00–14.50	18.00–20.00
L	St. Francis	12.00–22.00	13.00–20.00	16.00–25.00	30.00–55.00
B	Senate	5.00– 6.00	6.00– 7.50	7.50– 9.00	
N	Sheraton Palace	8.75–16.50	13.85–20.50	13.85–20.50	25.00–150.00
L	Sir Francis Drake	11.00–16.00	13.00–17.00	16.00–22.00	35.00–50.00
L	Stewart	7.00–12.00	9.00–14.00	11.00–18.00	26.00–30.00
N	Sutter	5.00– 7.00	7.00– 9.00	8.00–10.00	
C	Whitcomb	10.00–12.00	11.00–16.00	12.00–16.00	25.00–60.00
H	Worth	7.00–	8.00–	9.00–	

SAN FRANCISCO ANNUAL MEETING, OCTOBER 31-NOVEMBER 4

A Housing Bureau will be operated by the San Francisco Convention and Visitors Bureau for the Association. Since all requests for rooms are handled in **chronological order,** it is recommended that you send in your application as quickly as possible.

In making hotel reservations please use the blank below, indicating your first, second, and third choice of hotels listed. Because of the limited number of **Single Rooms Available,** you will have a better choice of securing accommodations in the hotel you prefer if your request calls for rooms to be occupied by two or more persons. Rates quoted are for the room, and in case of double occupancy, the rate will be shared.

No Minimum Rates, or any specific rate within the full price range quoted, can be guaranteed when your reservation is confirmed. Hotels make every effort to give you the requested rate. However, this is governed by prior check-outs and availability of such rooms on the date of your arrival.

All Requests Should Be Accompanied by a Deposit Check for $10 per room made out to the **APHA Housing Bureau.** Hotels cancel unclaimed reservations by 4:00 p.m. Therefore, a deposit is requested to insure that your reservations will be held on your arrival date—whatever the hour. Your deposit will be credited to your account. **Please Do Not Send Cash.**

Cancellations: Cancellations must be received 15 days prior to the meeting for refunds of your deposit to be made by the hotel.

Late Requests: Applications Received Later Than October 16 (15 days prior to the opening date of the convention) **will be returned.** In such cases please select your own hotels and write to them direct.

All reservations must clear through the Housing Bureau. All requests must give definite date and approximate hour of arrival and names and addresses of all persons who will occupy rooms requested.

ALL RESERVATIONS WILL BE CONFIRMED IF REQUEST IS RECEIVED NOT LATER THAN OCTOBER 16.

MAIL TO:

APHA HOUSING BUREAU
Room 300, 61 Grove Street
San Francisco 2, California

(*Note:* Single rooms are very scarce. Please arrange to share a twin-bedroom with another.)

PLEASE MAKE RESERVATIONS NOTED BELOW:

First Choice Hotel .....
Second Choice Hotel .....
Third Choice Hotel .....

Single Room .....
Double Bedroom .....
Twin Bedroom .....
Parlor, Bedroom Suite .....

Arrival ..... at ..... A.M. ..... P.M. Departure .....

NAMES OF ALL OCCUPANTS:
(Please bracket those sharing a room)

ADDRESSES:

....
....
....
....

Check For $..... payable to **APHA Housing Bureau** is enclosed. Please enclose a self-addressed stamped envelope.

MAIL CONFIRMATION TO: (Signed) .....
(Please print or type)

Address .....

City ..... Zone ..... State .....

NEWS OF AFFILIATED SOCIETIES AND BRANCHES

APHA Affiliated Societies and Branches

SOCIETY AND SECRETARY

ALABAMA PUBLIC HEALTH ASSOCIATION, Ralph Roberts, State Health Dept., Montgomery
ARIZONA PUBLIC HEALTH ASSOCIATION, Joseph J. Weinstein, Maricopa County Health Dept., Phoenix
ARKANSAS PUBLIC HEALTH ASSOCIATION, Mrs. Vada Russell, State Health Dept. Bldg., Little Rock
CALIFORNIA, NORTHERN, PUBLIC HEALTH ASSOCIATION, Mrs. Joan Davis, City Health Dept., San Jose
CALIFORNIA, SOUTHERN, PUBLIC HEALTH ASSOCIATION, Dorothea Hansen, City Health Dept., Los Angeles 12
COLORADO PUBLIC HEALTH ASSOCIATION, Alice de Bruyn Kops, 4660 S. Delaware, Englewood
CONNECTICUT PUBLIC HEALTH ASSOCIATION, Shirley Thayer, R.N., 61 Arnold Way, West Hartford 7
CUBAN PUBLIC HEALTH SOCIETY, Dr. Raphael Calvo Fonseca, Calle 19 No. 311 Altos Vedado, Havana
FLORIDA PUBLIC HEALTH ASSOCIATION, Everett H. Williams, Jr., P. O. Box 210, Jacksonville
GEORGIA PUBLIC HEALTH ASSOCIATION, Mrs. Martha Power, State Health Dept., Atlanta 3
HAWAII PUBLIC HEALTH ASSOCIATION, Alison MacBride, R.N., 510 S. Beretania St., Honolulu 13
IDAHO PUBLIC HEALTH ASSOCIATION, Ralph Carpenter, 120 N. Capitol Blvd., Boise
ILLINOIS PUBLIC HEALTH ASSOCIATION, William J. Hixon, Evanston Health Dept., Evanston
INDIANA PUBLIC HEALTH ASSOCIATION, Malcolm J. McLelland, State Board of Health, Indianapolis
IOWA PUBLIC HEALTH ASSOCIATION, Lloyd Cox, Iowa Hospital Association, 1012 Liberty Bldg., Des Moines
KANSAS PUBLIC HEALTH ASSOCIATION, W. W. Wilmore, Kansas Tuberculosis and Health Assn., 1134 Topeka Ave., Topeka
KENTUCKY PUBLIC HEALTH ASSOCIATION, Miss Peggy Fisher, 275 E. Main St., Frankfort
LOUISIANA PUBLIC HEALTH ASSOCIATION, A. G. Owens, P. O. Box 1872, Monroe
MARYLAND PUBLIC HEALTH ASSOCIATION, Mary Thompson, Prince Georges County Board of Education, Upper Marlboro
MASSACHUSETTS PUBLIC HEALTH ASSOCIATION, Mrs. Elizabeth K. Case, Dept. of Health, Cambridge
MICHIGAN PUBLIC HEALTH ASSOCIATION, Marjorie Delevan, 1817 West St. Joseph Street, Lansing
MINNESOTA PUBLIC HEALTH ASSOCIATION, D. S. Fleming, M.D., State Dept. of Health, University Campus, Minneapolis
MISSISSIPPI PUBLIC HEALTH ASSOCIATION, H. E. Boone, P. O. Box 1700, Jackson
MISSOURI PUBLIC HEALTH ASSOCIATION, Mrs. Nadia Craver, 5th Fl., State Office Bldg., Jefferson City
MONTANA PUBLIC HEALTH ASSOCIATION, Thomas S. Willett, Montana Public Health District 1, Hardin
NEBRASKA PUBLIC HEALTH ASSOCIATION, George R. Underwood, M.D., 935 R. St., Lincoln
NEW JERSEY PUBLIC HEALTH ASSOCIATION, Waldo McNutt, M.P.H., Delaware River Drive, Frenchtown
NEW MEXICO PUBLIC HEALTH ASSOCIATION, Daniel T. Marley, P. O. Box 2066, Albuquerque
NEW YORK CITY, PUBLIC HEALTH ASSOCIATION OF, Frances Ann McVey, 4317 Robinson St., Flushing 55, N. Y.
NEW YORK STATE PUBLIC HEALTH ASSOCIATION, Mrs. Kathleen Boland, Rensselaer County Health Dept., Troy
NORTH CAROLINA PUBLIC HEALTH ASSOCIATION, Robert W. Brown, Box 7525, Asheville
NORTH DAKOTA PUBLIC HEALTH ASSOCIATION, Alice H. Peterson, M.D., State Dept. of Health, Bismarck
OHIO PUBLIC HEALTH ASSOCIATION, Mrs. June O'Donnell, 3516 Braddock St., Dayton
OKLAHOMA PUBLIC HEALTH ASSOCIATION, Bill Burk, 3400 North Eastern, Oklahoma City
OREGON PUBLIC HEALTH ASSOCIATION, Muriel David, City Bureau of Health, 203 N.E. 28th Ave., Portland
PENNSYLVANIA PUBLIC HEALTH ASSOCIATION, Emma J. Petach, R.N., 324 N. Second St., Harrisburg
PUERTO RICO PUBLIC HEALTH ASSOCIATION, Mrs. Mae de Acin, Apartado 211, San Juan 2
SOUTH CAROLINA PUBLIC HEALTH ASSOCIATION, Emily Anne Easterling, Richmond County Health Dept., Columbia
SOUTH DAKOTA PUBLIC HEALTH ASSOCIATION, Alice Brady, R.N., State Dept. of Health, Pierre
TENNESSEE PUBLIC HEALTH ASSOCIATION, C. B. Tucker, M.D., State Dept. of Health, 420 Sixth Ave., N., Nashville
TEXAS PUBLIC HEALTH ASSOCIATION, Joseph N. Murphy, Jr., State Dept. of Health, Austin
UTAH PUBLIC HEALTH ASSOCIATION, Katherine Brandon, M.D., P. O. Box 25, Foothill Station, Salt Lake City
VIRGINIA PUBLIC HEALTH ASSOCIATION, Mrs. Helen W. Wiesmann, 1220 E. Broad St., Richmond
WASHINGTON STATE PUBLIC HEALTH ASSOCIATION, Caesar Branchini, General Electric Company, Richland
WEST VIRGINIA PUBLIC HEALTH ASSOCIATION, Mrs. Katherine L. Brown, State Dept. of Health, Charleston 5
WISCONSIN ASSOCIATION FOR PUBLIC HEALTH, Paul Weis, RR No. 2, Waunakee
MIDDLE STATES BRANCH, APHA, Thelma Luther, Dept. of Health, Des Moines, Iowa
SOUTHERN BRANCH, APHA, M. L. McDonald, Dallas Health Museum, Dallas, Tex.
WESTERN BRANCH, APHA, Robert G. Beaumier, 1309 Smith Tower, Seattle, Wash.

Middle States Plan Strategy

The Middle States Branch of the APHA gathered 350 of its public health swordsmen and their seconds together to look over the dwelling grounds of the "Challenges of the Sixties." The occasion, its 11th Annual Meeting (in conjunction with the Indiana Public Health Association) in Indianapolis, April 27-29.

A. C. Offutt, M.D., Indiana state health commissioner, and president, MSB, led off at the first session with a general orientation to the challenges in store. Robert Yoho, director, Division of Public Health Education, Indiana State Board of Health, then described some of the methods of facing up to them in "How It's To Be Done."

In six consecutive meetings during the remainder of the first and the morn-

ing of the second day's general sessions, registrants discussed with each of the principal speakers the following challenges of the new decade:

—Radiation, with Nathan H. Woodruff, Ph.D., director, Office of Health and Safety, U. S. Atomic Energy Commission, Washington, D. C.: We must have more trained health physicists and uniformity of radiation protection standards.

—Civil defense, with Kenneth Lauster, chief sanitary engineer, Health Services, Office of Civil and Defense Mobilization, Battle Creek, Mich.: Counter to current public health, we should explore the possibility of return to some earlier practices of basements and pits to provide a reduction in vulnerability; we must influence housing and school design to save life.

—Public health finances, with Earl O. Wright, chief, Division of Administration, Ohio Department of Health, Columbus: The challenge in this case is the vanishing of the public health dollar.

—Accident prevention, with Paul V. Joliet, chief, Accident Prevention Program, Division of Special Health Services, PHS, Washington, D. C.: "If we don't know how to make Americans behave more carefully, we had better find out . . . (the) profession can scarcely dodge . . . tackling a problem that costs the country so much every year in death and disability." All public health workers must become involved, with "humility . . . an overused word that specifically applies."

—Rehabilitation, with L. Burton Parker, M.D., chief, Physical Medicine Department, Marion County General Hospital, Indianapolis: "To restore an individual to his maximum potential requires medical direction throughout the entire process," a responsibility public health in all communities must recognize as its own. And "we are still not rehabilitating the handicapped."

—Home care, with Claire F. Ryder, M.D., chief, Health of the Aged Section, Chronic Disease Program, Division of Special Health Services, PHS, Washington, D. C., who pointed out what the profession should continue to do in the promotion of sound programs.

Section meetings which followed the general sessions were focused on these six challenges. At the final general session, the sections reported out 21 resolutions, many of which were in support of ways recommended to meet the challenges discussed. Before passage of resolutions, a panel of the presidents of associations in MSB-APHA (Illinois, Indiana, Iowa, Minnesota, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin) commented on what the associations were planning to do during the sixties.

The Middle States Branch, APHA, adopted a new constitution for an interim period, subject to final ratification through a mail ballot. Membership in the Branch now stands at 451, of whom 147 are nurses.

Ralph Kuhli, National Safety Council, Chicago, is the new president of the Branch. Other officers for 1960-1961 are:

President-Elect—Henry Bauer, Ph.D., director of medical laboratories, State Department of Health, Minneapolis, Minn.

Vice-President—Ruth E. Church, M.D., deputy director, Division of Hospitals and Chronic Illness, Illinois Department of Health, Springfield

Secretary-Treasurer — Thelma Luther, R.N., Division of Public Health Nursing, Iowa State Department of Health, Des Moines.

Organizations meeting in affiliation with the Branch were: Indiana Veterinary Medical Association; Health and Welfare Council of Indianapolis and Marion County; Conference on Dental Health-Indiana State Board of Health; Indiana Health Officers Association; and Indiana Adult Education Association. The Seventh Annual Harvey W. Wiley Memorial Lecture, sponsored by the Laboratory Section, Indiana Public

Health Association, was delivered by Charles Harp of the Public Health Service on "Agents of Chemical and Bacteriological Warfare." Marion Fry, APHA membership secretary, represented the Association at the MSB-APHA meeting.

Records Broken in South Carolina

South Carolina Public Health Association now has 845 members. At its recent 37th Annual Meeting 479 persons registered. Both figures are record-breakers. The meeting, in Myrtle Beach, ran from May 12-14.

The morning of Friday the 13th was given over to section meetings, with the public health nurses and the health educators considering specifically the "what, why, and how" of public health, the announced conference theme. Alice Clark, R.N., consultant nurse, Region IV, PHS, Atlanta, Ga., and Katherine Corbin, R.N., consultant nurse, Region IV, Children's Bureau, Atlanta, led the nurses, and Mary Lou Skinner, M.P.H., health education consultant, Region IV, PHS, Atlanta, led the educators through these basic questions to their discussions.

Maude C. Bailey, R.N., state supervising nurse, South Carolina State Board of Health, Columbia, described "Public Health Nursing Today" before the Medical Section, following a paper on "Dividends on Investments in Public Health" by Hugh B. Cottrell, M.D., M.P.H., deputy regional medical director and chief, General Health Services, Region IV, PHS, Atlanta. Earl W. Griffith, public relations representative, South Carolina State Board of Health, Columbia, addressed the Clerical Section. The Venereal Disease Control Section heard three panels discuss the challenges of VD control on different governmental levels, the coordinative role of the nurse as a VD investigator, and the private physician's place in such controls.

Elizabeth Davis' presidential address "Concrete Blocks" (barriers or builders?) opened the first general session. Principal speaker was Albert V. Hardy, M.D., assistant state health officer, Florida State Board of Health. In "Opportunities for Research in Health Departments" he characterized our times as being outstanding in research progress. Research in state and local health departments has not kept pace, but it must in the future. Chronic diseases, air pollution, and radiation hazards have created the need for local health departments to organize studies in the field as well as in laboratories and clinics. "Research—or stay behind" was his advice.

Dade W. Moeller, Ph.D., addressed the conference at the second general session on "Life and Half-Life," a discussion of radiological health. At the final session, Cylvia A. Sorkin, Ph.D., professor and chairman of the Graduate School Division on Counseling and Personnel, Washington University, St. Louis, Mo., gave her audience a conscience yardstick in "Would you hire yourself?" Human relations, she said, is understanding "the philosophy of treating the other fellow as if it were his last day on earth, not yours." People remember longer how they are treated than what they are taught.

SCPHA went on record in favor of stimulating the use of Salk polio vaccine, particularly among the more susceptible group of children under five years of age.

Service Award recipients for 35, 30, 25, and 20 years of loyal service in the field numbered 30 totaling 710 years of public health work. Those honored for 35 years were H. Grady Callison M.D., and H. C. Tiedemann. "A man's pride shall bring him low; but honor shall uphold the humble in spirit," is the quotation from Proverbs (XXIX-23) printed at the bottom of the page announcing these awards in the program.

Succeeding Elizabeth M. Davis as president was Betty Ficquett, R.N., M.P.H., consultant nurse, South Carolina State Board of Health, Columbia.

Other officers for 1960-1961 are:

President-Elect — Ruth P. Goettee, personnel officer, State Board of Health, Columbia

Vice-President—Martha M. Bradley, director of nursing education, South Carolina State Hospital, Columbia

Secretary—Emily Ann Easterling, clerk of the Richland County Health Department, Columbia

Treasurer—John B. Asbill, Finance Section, State Board of Health, Columbia

SCPHA Representative to APHA—G. S. T. Peeples, M.D., M.P.H., state health officer, State Board of Health, Columbia.

Marion Fry, membership secretary, APHA, represented the Association at the meeting. The South Carolina Association of Sanitarians met jointly with SCPHA.

Southern Branch Promotes Unity

A major objective of the 28th Annual Meeting of the Southern Branch APHA (Memphis, Tenn., April 13-15) was to give undeniable support to the idea of "Progress Through Affiliation." The principal illuminators of this theme were on hand at the opening general session. Reflecting on this idea, by pleasingly unusual arrangement, was a panel which under ordinary circumstances is usually known as the APHA Standing Committee on Affiliated Societies and Regional Branches. By whatever hat the audience recognized it under, CASRB aided and abetted the acceptance of the conference theme before representatives of Southern public health. CASRB had met in Memphis on the second day of the meeting.

When registrants (398—199 men and 199 women) were not in scientific sessions or otherwise professionally engaged, it was apparent from the hum of their discussions at meeting headquarters that one of the major issues of the 1960 meeting was the establishment of a regional office for the Southern Branch. (This, incidentally, now means the maintenance of such an office, since in January a temporary office was set up to handle branch affairs on a trial basis until this annual meeting.)

Southern Branch now seeks financial support from each of the 16 state affiliates in its area—$200 from each. So far, seven APHA Affiliated Societies have committed themselves for this amount. The Branch's Governing Council also has now asked APHA for an emergency grant of $2,500 to help support the office. This request it has forwarded to the APHA Executive Board through the CASRB, which recommends its approval if APHA's financial condition permits.

The afternoon of the first day and the entire second day of the meeting were given over to the scientific sessions of the nine Southern Branch sections. A most extensive program included discussions that spanned content from "Family Planning: A Concept in Preventive Medicine" (Mary S. Calderone, M.D., medical director, Planned Parenthood Federation of America—before Health Officers' Section) to "Nutrition Aspects of Coordinated Community Care in Chronic Disease," a panel discussion presided over by Ruth Brennan, St. Louis (Mo.) County Health Department, chairman, Nutrition Section. Name it, the meeting had it, in some form or other.

At the closing general session (a breakfast) Calvin D. Johnson, vice-president, Remington-Rand Corporation, New York City, spoke on "Opportunities Unlimited." As the Journal goes to press, the copy of his talk is not at hand. The presumption is that his audience drew practical inferences for the general conference theme "Progress Through Affiliation."

Guy M. Tate, Jr., director, Bureau of Sanitation, Jefferson County Health

Department, Birmingham, Ala., was installed as SBAPHA's new president, succeeding Betty Ficquett, R.N., consultant nurse, Maternal and Child Health Division, State Board of Health, Columbia, S. C. Other 1960-1961 officers are:

First Vice-President — Hamilton W. Stevens, M.D., district health director, Buncombe County Board of Health, Asheville, N. C.

Second Vice-President—Luther E. Fredrickson, D.V.M., public health veterinarian, Tennessee Department of Public Health, Nashville

Third Vice-President — Emily Bartholomai, public health administrator, Division of Local Health Organization, State Department of Health, Atlanta, Ga.

Secretary-Treasurer—M. L. McDonald, director, Dallas Health Museum, Dallas, Tex.

Delegate to the APHA—Betty Ficquett, R.N.

Berwyn F. Mattison, M.D., executive director, APHA, represented the Association at this meeting. On the day preceding the meeting, Marion Fry, APHA membership secretary, conducted an Association Management Institute for the public health association officers of Texas, Oklahoma, Missouri, Arkansas, Louisiana, Mississippi, Alabama, and Tennessee.

Utah: New Section, New Award-to-Be

The report from the Beehive State is that 220 public health workers gathered April 25-26 for the annual meeting of the Utah Public Health Association, held this year on the campus of the University of Utah, Salt Lake City.

The meetings featured John Lichty, M.D., M.P.H., president of the Western Branch, American Public Health Association, who spoke on the future of public health, and about advances in the management of child health conferences in particular, and Alan Foord, M.D., M.P.H., clinical professor of maternal and child health at the University of California School of Public Health, who discussed school health services and moderated a panel on the subject. Air pollution, radiological aspects of public health, and hospital sanitation shared the other spotlights of the meeting.

R. O. Porter, M.D., chairman, Utah State Board of Health, was present at all UPHA meetings and lead the discussion in the newly organized Health Officers Section.

W. R. Elton Newman, M.D., College of Medicine, University of Utah, was outgoing president. New officers for 1960-1961 are:

President—Delmar Stone, M.P.H., health educator, Salt Lake City Health Department

President-Elect—Ruth Ann Purhonen, executive director, Salt Lake Area Mental Health Association

Vice-President—Franklin Brough, M.P.H., executive director, Utah Tuberculosis and Health Association

Secretary-Treasurer—Kathryn Brandon, M.D., M.P.H., consulting pediatrician, Salt Lake City Schools.

UPHA is embarking on a membership drive for APHA as well as itself. The secretary reports that APHA membership material "was taken by a number of people early the first morning and we could have used triple the number of leaflets."

UPHA has established a new committee to select a person in the state to receive an annual award for having contributed the most to public health.

Arizona—Community Participation

The Arizona Public Health Association was concerned with "Community Groups—Forces for Public Health" at its 32nd annual meeting at Phoenix (April 20-22). This topic was the theme of a final summary panel which tied together the deliberations of four panels preceding it and stressed the importance of a unified approach to the problems of public health. The panels, with refreshingly new kinds of casts, had dealt with organized labor, agriculture, voluntary agencies, and industry as forces for public health. An attorney,

union president, secretary of a state AFL-CIO education committee, state legislator, farm manager, bank manager, TB association board chairman, county board of health chairman, candidate for state governor (also heart association board chairman), funeral director, state health department sanitation chief, representative of the PHS, and college physical education director held the stage.

State Governor Fannin at the opening session spoke of the state's health as the "challenge of a growing society." With population growth there has been a corresponding jump in moneys spent for public health. In 1937, 42 cents per person went for public health as compared to $2.15 in 1957.

The gubernatorial candidate, Lee Ackerman, advocated a state level "summit conference" on public health, which would define what areas are state and local responsibilities, which come under voluntary agencies and which under private medicine.

Several proposed amendments to the Arizona association's constitution regarding elections of secretary and treasurer, the representatives to APHA Governing Council, and other proposals were voted down. APHA's recommendation on rebates was approved.

Melvin R. Wise, director, Bureau of Vital Statistics, State Health Department, was program chairman. H. Gilbert Crecelius, Ph.D., director of laboratories, State Health Department, Phoenix, was outgoing president; J. Rex James, administrative officer, Maricopa County Health Department, Phoenix, was outgoing secretary. Officers for 1960-1961 are:

President — George Marx, sanitary engineer, Arizona State Department of Health

President-Elect — Hugh H. Smith, M.D., M.P.H., chairman, Pima County Board of Health

Vice-President — Dorothy Keneally, Phoenix Council, National Association for Retarded Children

Secretary—Joseph J. Weinstein, director, Environmental Sanitation, Maricopa County Health Department.

Maryland: First Printed Newsletter

As records should, Vol. 1, No. 1 of "The Record," the first printed newsletter of the Maryland Public Health Association, gives much basic information about the organization, listing its goals and the members of its committees.

A message from its president, Ferdinand A. Korff, points out that "now in its fifth year (MPHA) is attaining organizational maturity. Committee guidance and effort have enabled affiliation with the American Public Health Association. Our annual meetings have been real ventures in public health education and have served also to challenge our members in their daily endeavors."

Through The Record, a three-page leaflet, MPHA hopes to be "in session throughout the year," not only at its annual meeting. Edited by MPHA'S Public Relations Committee, Joseph Gordon, chairman.

American Public Health Association membership application blank on page XXVII

EMPLOYMENT SERVICE

The following pages present information for those seeking public health personnel and for those seeking positions in public health. Other information concerning vacancies and personnel available is on file in the Association office. Anyone wishing to have the benefit of this additional information can obtain it by writing to the Vocational Counseling and Placement Service of the Association.

Advertising space in these pages is available at special rates for the use of employers or individuals. The charges are $5 for the first 50 words or fraction thereof and $1 for each additional 10 words or fraction thereof. There is no charge to members or Fellows of the Association who desire to utilize the **Positions Wanted** portion of these pages. **Closing date** for receipt of advertisements is the first of the month preceding the desired month of publication. **All correspondence should be sent to the American Public Health Association, 1790 Broadway, New York 19, N. Y.**

POSITIONS AVAILABLE

Local Health Officers—Florida. Two well organized local health units near Pensacola on the Gulf Coast. Starting salary $9,120-$11,040 dependent upon previous training and experience. Travel allowance, retirement, other benefits. Write Wilson T. Sowder, M.D., State Health Officer, Florida State Board of Health, P. O. Box 210, Jacksonville, Fla.

Assistant Health Director — City-County Unit, serving 250,000. Newly created position. Duties may be assigned according to preferences of applicant. Salary range $11,364-$13,548. M.P.H. preferred. Equivalent experience acceptable. Write to Dr. James Speers, Public Health Director, City of Des Moines, Des Moines, Iowa.

Local Health Officer—Positions open in various-sized communities in Kansas. Salary range from $10,920-$13,696 per year. Possible first-year salary of $11,460. Minimum qualifications: M.D. degree, internship, license to practice medicine in Kansas or eligibility for same, M.P.H. degree, and public health experience. Additional public health experience may be substituted for M.P.H. degree. Contact Personnel Officer, State Board of Health, State Office Bldg., Topeka, Kans.

Public Health Physician — as assistant county health officer for well organized county health department in the Middle West. Good salary. Excellent employment benefits. Male or female. Write **Box PH-3,** Employment Service, APHA.

Pediatrician — for State Health Department. To act as pediatric consultant within agency and work with professional and lay groups in the field. Included in work: hospital standards, school health problems, statistical studies, future program planning. Starting salary $12,240. Ohio medical license, one-year internship, at least two years' graduate training required; preferably Board of Pediatrics or eligible. Civil service position, vacation, sick leave, annual salary increments, and retirement plan. Staff appointment to state university if eligible. Address inquiries to Division of Child Hygiene, Ohio Department of Health, Columbus 15, Ohio.

Health Officers—Coos and Yamhill County positions now open. Starting salary $13,500-$14,500, depending on qualifications. Applicants should have M.P.H. degree and some public health administrative experience. Must be eligible for licensure to practice medicine in Oregon. Social Security supplemented by state retirement and merit system coverage. Write Mr. A. T. Johnson, Personnel Director, Oregon State Board of Health, P. O. Box 231, Portland 7, Ore.

District Health Officer—Public health administrator of a district area; district epidemiologist. Plan, organize, supervise work of professional staff consisting of engineers, nurses, sanitarians, nutritionists, dental hygienists, health educators, and social workers. Requires M.D. and M.P.H. degrees and license to practice medicine in Wisconsin. Salary: Beginning level $12,048-$15,048 per year based upon number of years of residency training and certification by the American Board of Preventive Medicine. Maximum salary $16,848 per year. Civil service, vacation, sick leave, Social Security, retirement, group health and life insurance benefits, travel allowance. For applications and further information write R. J. Siesen, Personnel Officer, State Board of Health, State Office Bldg., Madison 2, Wis. First review of applications will be on October 1, 1960.

Director, Local Health Services—Work with district health officers and professional staff in improvement of local health services. Act as liaison between district and central office staff. Requires M.D. and M.P.H. degrees, two years' residency, certification by the American Board of Preventive Medicine, and license to practice medicine in Wisconsin. Beginning salary $16,248 per year; maximum salary $18,048 per year. Civil service, vacation, sick leave, Social Security, retirement, group health and life insurance benefits, travel

allowance. For applications and further information write R. J. Siesen, Personnel Officer, State Board of Health, State Office Bldg., Madison 2, Wis. First review of applications will be on October 1, 1960.

Director, Bureau of Maternal and Child Health—Plans and directs a state-wide program for the conservation and improvement of maternal and child health; coordinates and supervises the activities of the bureau. Major activities include the child guidance, school health, and nutrition programs. Requires M.D. and M.P.H. degrees, certification by the American Board of Preventive Medicine or Pediatrics, preferably the latter, and license to practice medicine in Wisconsin. Beginning salary $18,648 per year; maximum salary $20,448 per year. Civil service, vacation, sick leave, Social Security, retirement, group health and life insurance benefits, travel allowance. For applications and further information write R. J. Siesen, Personnel Officer, State Board of Health, State Office Bldg., Madison 2, Wis. First review of applications will be on October 1, 1960.

Public Health Nurse — Immediate openings in generalized health program in beautiful, smog-free, snow-free Fresno. Valley city; 209,000 population in metropolitan area. Midway between Los Angeles and San Francisco. Close to three national parks. Two colleges and other cultural advantages in beautiful Fresno. Salary $4,836-$6,036. Requires California registered nurse license and California public health nurse certificate. Appointments will be made pending issuance of aforementioned license and certificate. Civil service positions, but examination not required. Apply immediately to Fresno County Civil Service Office, Room 101, Hall of Records, Fresno, Calif.

Public Health Nurse — City of Long Beach, Department of Public Health. Salary range $439-$537. Requirements are graduation from an approved program in public health nursing and California P.H.N. certificate. Generalized program with exception of school nursing in a city of 324,000. Forty-hour week, annual and sick leave, city paid medical insurance. Retirement and Social Security benefits. Car furnished. Apply, I. D. Litwack, M.D., Health Officer, 2655 Pine Ave., Long Beach 6, Calif.

Assistant Director, Public Health Nursing—Assists in administering a combined official and voluntary program, including a university field student program. Plans and assists educational nursing program. Eligibility for valid certificates as R.N., and P.H.N. in California. Education and experience equivalent to master's degree and four years' public health nursing work, including two years in supervisory and administrative capacity. Examination on or about August 20, 1960. Salary $6,588-$8,232. Contact San Mateo County Civil Service Commission, Courthouse, Redwood City, Calif.

Public Health Nurse I — $5,057-$5,537. Challenging position in generalized public health nursing with progressive suburban department 17 miles west of downtown Detroit. Many liberal fringe benefits. Apply, Amalia Krause, Nursing Director, Wayne County Health Department, Eloise, Mich.

Junior Public Health Nurse — Salary range $4,160-$4,979. Liberal retirement and sick leave benefits. New modern building. Promotional opportunities. Apply Flint Civil Service Commission, City Hall, Flint 2, Mich.

Public Health Nurse III (District Advisory Nurse)—Give guidance and counseling to all public health nurses in a multiple-county area regarding community organization and relationships, program planning, public health nursing technics, records, and reporting. Responsible for inservice education program for local public health nurses and evaluation of nursing services. Salary range $5,688-$6,768, plus travel allowance. B.S. degree with major in public health nursing and three years' generalized experience as a public health nurse. Special requirements: registration or eligibility therefor as a registered nurse in Wisconsin; certification or eligibility for certification as a public health nurse in Wisconsin. Write R. J. Siesen, Personnel Officer, State Board of Health, Madison 2, Wis.

Public Health Nurse — for a two-nurse City Health Department. Good salary, excellent personnel policies including retirement, Social Security and two weeks' vacation after the first year. Generalized program. Modern office. Wisconsin Rapids Board of Health, 111 1st St. North, Wisconsin Rapids, Wis.

STATISTICIAN

Male

Opening September, 1960, for Junior Statistician to act as assistant, Division of Statistics and Biometrics, Department of Laboratories, Toronto General Hospital.

Write or telephone:

Director of Laboratories,
Toronto General Hospital,
101 College Street,
Toronto, Ontario, Canada

Telephone EM 6-8211, Local 2108.

Public Health Engineer I—to work in water, sewage, and subdivision programs of rapidly growing county health department. Engineering degree with major in sanitary engineering, public health engineering, or industrial hygiene. Starting salary $502 per month; $527 in six months. Good opportunity for advancement. Normal fringe benefits. A chance to live all your life where most people hope to retire. If interested, wire collect for application forms to J. Rex James, Maricopa County Health Department, 116 South 12th Ave., Phoenix, Ariz.

Industrial Hygiene Engineer—Assist in administering industrial hygiene services on a state-wide basis. Bachelor's degree in engineering, professional engineer license, and considerable experience in industrial hygiene necessary. Monthly salary range $660-$785. Civil service, vacation, sick leave, excellent comprehensive retirement system. Travel with expenses paid. Write to H. G. Bourne, Jr., Division of Industrial Hygiene, Ohio Department of Health, Room 306, Ohio Departments Bldg., Columbus 15, Ohio.

Professional Engineer—To assist in the development and administration of an expanded air pollution control program on a state-wide basis. Requirements: Academic degree in engineering, registered professional engineer, considerable experience in industrial hygiene and/or air pollution. Salary range $7,920-$9,420. Employee benefits: civil service appointment, excellent retirement system, sick leave, paid vacation, and travel expenses. Address inquiry to H. G. Bourne, Jr., Ohio Department of Health, Room 306, Ohio Departments Bldg., Columbus 15, Ohio.

Engineers—State Department of Health. Two responsible positions for trained and experienced sanitary engineers. Starting salary for one position is $626 per month; for the other, $541 per month. Apply Arizona Merit System, Capitol Bldg., Phoenix, Ariz.

Bacteriologist III—$516-$626. Assistant director, public health laboratories, responsible for technical phases of laboratory work. Need master's degree in bacteriology and three years' employment in a public health laboratory or comparable agency, including a year of supervisory experience. A doctorate degree in bacteriology may be substituted for one year of general experience. Apply Arizona Merit System, Capitol Bldg., Phoenix, Ariz.

Bacteriologist II—$444-$541. College graduation with minor in bacteriology and three years' experience in public health laboratory or comparable agency. A major in bacteriology may be used as a substitute for one year of experience, a master's degree in bacteriology for two years of the experience. May supervise branch laboratory. Apply Arizona Merit System, Capitol Bldg., Phoenix, Ariz.

Public Health Sanitarian—Vacancy in generalized environmental sanitation program in a county health department. Liberal travel, vacation, sick leave, and retirement benefits. Located in the center of one of the most scenic recreational areas of America. Salary $4,620-$5,120. Must be eligible for registration in Colorado. Write Director of Public Health, 515 Patterson Ave., Grand Junction, Colo.

Chief, Division of Food and Sanitation—in health department of progressive mid-west city of 65,000. Responsible for slaughter-house regulations, meat and milk inspection, and environmental sanitation. D.V.M. degree and public health experience required. Salary range $7,308-$8,508. Retirement plan and Social Security, hospitalization and liberal sick leave, and vacation benefits. Write Supervisor of Personnel, Room 1, City Hall, Kenosha, Wis.

Associate Biostatistician—Under general direction, plans and coordinates biostatistical studies for a division of the New York State Department of Health, Albany, N. Y. Salary $7,818-$9,408 in five annual increments. Qualifications: Master's degree from an approved school of public health with specialization in biostatistics or a master's degree in statistics, and three years of professional statistical experience of which one year must have been in a public health or medical agency. For details write Mr. Richard H. Mattox, Director of Personnel, State Department of Health, 84 Holland Ave., Albany, N. Y.

Health Educator—Assist county health departments in developing generalized health education programs. College graduation with one year of graduate training in accredited school of public health. Starting salary $5,000; travel seven cents per mile. Merit system, vacation, sick leave, Social Security, retirement benefits, and group insurance plan. Write Mississippi State Board of Health, Division of Public Health Education, Box 1700, Jackson, Miss.

Public Health Educator—Challenging opportunity to develop community educational technics in the control of alcoholism. Desirable qualifications: M.P.H. or college graduate with specialized health education experience. Salary $6,700-$7,460. Liberal benefits. Write Hilbert Mark, M.D., M.P.H., Commissioner, City Health Department, Toledo 2, Ohio.

Public Health Educator III (School Health)—Initiate and develop school-community health education programs in a multi-county district. Desirable qualifications: M.P.H. degree, plus two years' experience in health education; sound working knowledge of principles of education and methods of teaching. Salary starts at $6,048; maximum $7,188. Travel allowance, vacation, sick leave, retire-

ment, and group insurance plans. Write Dr. Amy L. Hunter, Director, Bureau of Maternal and Child Health, Wisconsin State Board of Health, Madison 2, Wis.

Public Health Educator III (Dental Hygienist) — Assist in developing dental health programs for preschool and adult groups in a several county area. Coordinate dental health education activities with over-all health education program. College graduation, a year of graduate training in an accredited school of public health, and two years' experience. Licensure or eligibility for licensure to practice dental hygiene in Wisconsin essential. Salary starts at $6,048; maximum $7,188. Civil service, vacation, sick leave, Social Security, and retirement benefits. Write R. J. Siesen, Personnel Officer, State Board of Health, 400 State Office Bldg., Madison 2, Wis.

Health Educator III—$5,328. M.P.H. in health education. State Health Department position; to be filled in August. Contact Arizona Merit System, Capitol Bldg., Phoenix, Ariz.

Regional Nutritionist — (Nutritionist I, $5,268-$6,716.) Serves as Regional Nutritionist in a generalized public health program. Master's degree and two years' experience as a nutritionist, dietitian, or teacher of food and nutrition. For applications or further information, please write C. Earl Albrecht, M.D., Deputy Secretary of Health, P. O. Box 90, Harrisburg, Pa. Applications should be mailed no later than July 29, 1960.

POSITIONS WANTED

On Box Numbers, Address APHA at 1790 Broadway, New York 19, N. Y.

Teaching and Student Health—University staff position wanted. Experience includes clinical practice and medical school (preventive medicine) appointment. Fellow, American Academy of Pediatrics; M.P.H. **Box PH-6,** Employment Service, APHA.

Chronic Disease Expert—widely experienced in public health practice and administration, basic research, and public relations, seeks challenging position or opportunity to create same. **Box PH-7,** Employment Service, APHA.

Public Health Laboratory Director or Associate Director—desires position in city, county, state or branch of state health department laboratory. B.S. and M.S., bacteriology; M.P.H., public health laboratory methods. Two years' experience as assistant laboratory officer, U. S. Army (World War II). Approximately 14 years' experience as director, city health department laboratory. **Box L-75,** Employment Service, APHA.

Sanitarian — Age 35, single. Two years' college; Sanitary Inspector, Tropical Hygiene, and Meat and Other Foods Certificates from the Royal Society for the Promotion of Health, London. Twelve years' experience with the government of Trinidad and Tobago, West Indies. Permanent United States resident; will become a citizen shortly. **Box S-37,** Employment Service, APHA.

Commercial Advertisements

All communications on the following commercial advertisements should be sent to Burneice Larson, Medical Bureau, Suite 605, 900 North Michigan Avenue, Chicago 11, Ill.

OPPORTUNITIES AVAILABLE

(a) M.D. director of health services and 350 bed hospital; opportunity for reorganization; near San Francisco. (b) Public health physician as chief, Bureau of Maternal and Child Health; direct all professional services; southern California. (c) M.D. health commissioner, county seat near major industrial center; Midwest, $17,000. (d) Nurse, direct co-educational college health service, Middle West, $7,000. (e) Nurse, chairman public health department, leading university college of nursing; Pacific, $700-$800 month. (f) Nursing consultant, develop industrial program near San Francisco; $7,000-$8,500.

SITUATIONS WANTED

(1) M.D. public health administrator, M.P.H. Columbia; Diplomate Preventive Medicine, P.H.; 15 years' experience health officer. (2) Nurse administrator, B.S., M.P.H. Columbia University; twelve years as executive director, city-county and community health programs.

BOOK REVIEWS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

CHRONIC ILLNESS IN A RURAL AREA (Vol. III)—By Ray E. Trussell and Jack Elinson. Cambridge, Mass.: Harvard University Press, Commonwealth Fund (1 East 75th St.), 1959. 440 pp. Price, $7.50.

For anyone who still clings to the notion that nobody, or hardly anybody, in the United States who needs medical care goes without it, this book has much to teach. It reports the findings of a highly sophisticated study of chronic illness in Hunterdon County, N. J. (population 43,000), in 1952. Summarizing, the authors write: "Medical supervision was needed by eight out of ten persons (79 per cent) for one or more disabling conditions per person, but less than four out of ten (37 per cent) received it. Drug or diet therapy was required by half of the clinical evaluation sample (49 per cent), but only 15 per cent received it. Surgery was needed by 21 per cent, but only 4 per cent had surgery . . ."

This important monograph is Volume III of the four volumes reporting the work of the national Commission on Chronic Illness. It complements an urban morbidity study in Baltimore, Md., a volume on prevention of chronic illness, and one on care of the long-term patient.

As significant as its substantive findings are the methodological lessons of this field research. It is the first large-scale study to have tested the reliability of household interviews as a measure of the general prevalence of disease. Despite the contention of some that population surveys exaggerate morbidity, the subsequent performance of detailed medical examinations in this county revealed great underreporting. Indeed, only 22 per cent of the conditions established on medical examination were recorded in the family interviews.

The study is loaded with data on specific disorders, their possible preventability, their prognosis, types of care needed, yields from multiple screening, rehabilitation potential, and other facets of illness. One might wish that correlations with socioeconomic status had also been examined, but perhaps this has been done adequately in other studies.

This report is far more than an account of "chronic" illness in a "rural" area. It is a sweeping examination of the health status and needs of a total population, done with unprecedented thoroughness and reported with remarkable clarity and restraint. Solution of the problems revealed obviously requires action both on an economic and an organizational level. While such proposals were not within the scope of the study, this book provides a gold mine of data for public health and medical care planning in the years ahead.

MILTON I. ROEMER

WHERE SOMEBODY CARES. MARY MANNING WALSH HOME AND ITS PROGRAM—By Mother B. Bernadette de Lourdes. New York, N. Y.: Putnam's (210 Madison Ave.), 1959. 252 pp. Price, $5.00.

In reviewing this book, written in a warm and brilliant style, we have to exercise restraint to choose words of limited praise and admiration for the perfection in which the project has been realized.

This book reports a wonderful example of what concern and money can do in the hands of intelligent administrators who seem to have thought of everything. The latest scientific con-

cepts which include the social, medical, nursing, psychological, rehabilitative, recreative, and other services so essential to properly understand and meet the needs of the aged have been ably applied.

The complexity and multiplicity of the factors in a total care program for the aged have been clearly outlined, analyzed, and presented with unusual ingenuity. This project, blessed with a highly competent administrative planning body and skillful use of funds, presents a successful pattern for everyone to consider.

A beautiful trail has been blazed. The experience and knowledge gained will serve to guide others in the development of services for the aging population. The careful reading of this volume is a must for physicians, health workers, hospital administrators, and civic leaders.

MARIAN R. STANFORD

EDUCATION AND HEALTH OF THE PARTIALLY SEEING CHILD (4th ed.)—By Winifred Hathaway. Edited by Franklin M. Foote; Dorothy Bryan; and Helen Gibbons. Columbia University Press (2960 Broadway), 1960. 201 pp. Price, $5.00.

This well written little book outlines clearly the problems of the partially seeing child and delineates methods of identifying these children and meeting their health and educational needs.

The editors state that approximately one out of 500 pupils in our schools have vision of less than 20/70 in the better eye after all necessary medical and surgical treatment and compensating lenses have been provided. Since thorough eye examinations are not provided for all preschool children, some partially seeing children will not be identified until they are in school. The importance of school-vision screening tests is emphasized.

The editors feel that the health needs of these children are the same as for all children and, in addition, they have the special need of continued ophthalmological supervision. There should be close collaboration between the child's eye doctor and the school. However, the eye condition, important as it is, should not be allowed to overshadow his need for over-all health supervision as a growing child.

The book outlines how the educational needs of the partially seeing child can be met in rural and urban communities through the use of itinerant teachers, specially equipped home rooms, special classes, and thorough integration of the partially seeing child as far as possible in regular classrooms. The program in each community would vary with its size and the facilities available. The importance of educational media, such as large type textbooks, magnifiers, telescopic lenses, and talking books, is outlined.

Previously, the emphasis was on the child's handicap and the limitations imposed by the eye condition and, therefore, special methods of instruction were sought. The editors feel that the danger of increasing the handicap has been overemphasized. When the potentialities of partially seeing children began to be stressed more than their limitations, the emphasis changed to special educational media and regular methods of instruction.

The editors discuss the role of the home, school, and the community in meeting the needs of the partially seeing child. What they say could be applied to programs for any handicapped child. School and community activities for meeting the health needs of all school children are outlined in an extremely clear and concise manner.

There are three reasons why all school administrators, teachers, eye specialists, general practitioners, pediatricians, school nurses, and public health workers should read this book: (1) It clearly defines the problems of the partially seeing child and outlines methods

of meeting these needs; (2) It describes concisely a school and community program to meet the health needs of school children; and (3) It outlines a school and community program applicable to meeting the needs of any handicapped child. R. GERALD RICE

HOME CARE AND HOUSING NEEDS OF THE AGED—New York State Division of Housing, Albany, N. Y. 56 pp. plus Appendix and Bibliography. (No date or price indicated.)

AGED HOME CARE PATIENTS IN NEW YORK CITY—New York State Division of Housing, Albany, N. Y. 1958. 40 pp. (No price indicated.)

The increasing number of reports designed to guide administrators of programs for the aged and based upon prior research is one sign of the development of gerontology. The two reports under review are good examples. Each summarizes a number of sound research projects providing the field worker with relevant data, and each makes a number of practical recommendations based on these studies.

"Home Care and Housing Needs of the Aged" was prepared by John G. Steinle and associates for the state housing authority to: (1) "determine the feasibility and requirements for a housing program that will meet home care needs of the aged"; and (2) "to prepare an outline for an action program."

The inseparable triad—health, income, and housing—are examined in a review of seven major studies. The data are convincing that chronic illness increases with age and that illness is a major factor contributing to indigency. "Chronic illness of the aged is the nation's number one health problem."

While the report stresses the need for a variety of approaches, a series of recommendations are made with reference to aged who suffer from chronic illness. The formulae for estimating number of aged with chronic illness in a given community and the need for nursing and housekeeping services should prove helpful.

The second study was made by the Housing Division's Bureau of Research and Statistics. Data collected in 1954 for a study of home care services in New York City are analyzed with reference to the aged. These data show that most home care patients are elderly, receive small incomes, are socially isolated, and prefer home care to institutionalization. Some implications of this for public housing administrators are spelled out. DONALD P. KENT

EPIDEMIOLOGY OF MENTAL DISORDER—Edited by Benjamin Pasamanick. Washington, D. C.: American Association for the Advancement of Science [1515 Massachusetts Ave., N.W.], 1959. 295 pp. Price, $6.50. Prepaid to AAAS members, $5.75.

There is a real need for a definitive methodological text on the use of epidemiological methods in the field of mental disorder. The title of this book may mislead one into thinking that this need has been met. A more accurate title would be: A Description of Some Epidemiological Research in Mental Disorder.

It is a report of a symposium held in December, 1956, and contains a number of interesting papers reporting epidemiological mental health and mental illness research. The author grandly states that "the investigators who presented and discussed papers in this volume probably comprise the majority of the investigators in this field. They come from the disciplines of psychiatry, psychology, sociology, public health, biostatistics, pediatrics, anthropology, genetics, and medicine. The studies reported range chronologically in the life cycle from conception to old age."

Although this volume contains a description of some of the most significant American research carried out prior to December, 1956, it completely omits the

investigations and research being done in other parts of the world.

Three years have elapsed since the symposium and some of the research reported has been published more completely elsewhere. MOTTRAM TORRE

HEATING, VENTILATING, AIR CONDITIONING GUIDE, 1959 (37th ed.)— American Society of Heating, Refrigerating and Air Conditioning Engineers. New York, N. Y.: (62 Worth St.), Price, $12.00.

The 768-page Technical Data Section follows the general format of previous editions and is divided into 12 general sections: Fundamentals; Environment, Comfort, and Physiological Principles; Heating and Cooling Loads; Room Heating and Cooling Methods and Equipment; Air Systems and Equipment; Steam and Water Systems and Equipment; Heat Generating Methods and Equipment; Refrigeration, Spray Apparatus, and Sorbents; Controls, Instruments, and Motors; Specific Applications; Industrial Systems; General.

The subjects for five new chapters are: High Temperature Water Systems; The Heat Pump; Evaporative Air Cooling; Humidification; and Snow Melting.

Chapters have been edited and expanded to include new outdoor winter design temperatures based on probability of occurrence of various temperatures; new steam pipe sizing charts and tables based on Moody friction data for steam flow; a revised table on gages and construction of air ducts including low-, medium-, and high-pressure ducts; revised information and illustrations for unit ventilators and their application; and a rewritten chapter on automatic control with new illustrations of control applications.

This edition also contains a general revision of the information on sorbents, including their use at elevated pressures; data on heat transfer coefficients for ventilated attics; revised information on sound absorption in ducts and plenums, noise levels, and diffuser noise; up-to-date values for maximum allowable concentration of contaminants in occupied spaces; a new section on the gas-fired year-round residential air conditioner; new data on duct construction for residences; a revised discussion of fuel utilization, efficiency and consumption; a rewritten chapter on school systems; and additions and changes in the list of codes and standards.

Revisions and additions have been made in 32 chapters of the "1959 Guide." Aside from the changes in the specific chapters, numerous other improvements have been made in both the text and illustrations.

For convenient reference to equipment for various types of installations the Catalog Data Section contains 461 pages showing the products of 309 manufacturers of heating, ventilating, cooling, and air conditioning equipment. The Catalog Data Section also includes an equipment index broken down under numerous headings.

The Guide Committee has apparently carefully analyzed the entire Technical Data Section to make sure the information in the 37th edition has kept abreast of current practice and is presented in a way beneficial to the engineer, contractor, educator, and student.

Both the Technical and Catalog Data Section are indexed throughout. The ASHAE Psychometric Chart, 24 x 32 inches, is included with each copy of "The Guide." J. ROBERT CAMERON

LIVING BEYOND YOUR HEART ATTACK— Eugene B. Mozes. New York, N. Y.: Prentice-Hall (70 Fifth Ave.), 1959. 212 pp. Price, $3.50.

This is a well written book for those who fear, or have had, a heart attack. It begins with a lucid explanation of the structures and functions of the heart and ends with the phrase, "You can live a full life after a heart attack." In between, to pick chapters at random, it

deals in reasonable and readable fashion with the symptoms of a heart attack, diagnosis, treatment, tobacco, alcohol and sex, cholesterol and calories, back to work, age and sex, and temperament and tension. A good glossary and index are included.

WATER SUPPLY FOR RURAL AREAS AND SMALL COMMUNITIES — By Edmund G. Wagner and J. N. Lanoix. WHO Monograph Series No. 42. New York, N. Y.: Columbia University Press (2960 Broadway), 1959. 337 pp. Price, $6.75.

As stated in the foreword of the book, the authors have made an effort to discuss the problems of rural water supply in a clear and realistic manner and to avoid nebulous concepts which cannot possibly apply to most of the rural underdeveloped areas of the world at the present time. On the other hand they have tried to show the minimum facilities necessary in small communities and individual households in order to satisfy the basic personal and public health objectives of water supply schemes. The authors recognize the fact that a copious and safe water supply is one of the leading, if not the leading, public health problem in many parts of the world. Their discussion should provide not only the trained engineer and sanitarian, but also the health officer and other members of the public health staff with basic information that should be put to use when a water supply project is being considered.

As would be expected, the volume includes a discussion of the public health reasons for a good water supply and also some of the financial considerations that must be recognized. Most of the volume is given over to a discussion on the technical matters of developing water supplies. This includes the fundamental engineering and geological considerations, as well as descriptions of the usual types of water sources that may be developed in rural areas.

The volume is practical and well illustrated. The discussions are straightforward and should be understandable by anyone with a good grasp of the English language. Many worth-while bibliographical and reference items are included. Although the volume is presented as having been prepared for underdeveloped areas, it would be highly valuable in any country where individual or small water supply systems are used. The principles and the technical details given would apply equally well in a rural area of the United States or Canada and a remote area of South America or Africa.

PROCEEDINGS OF THE THIRD MEDICAL AND EDUCATIONAL CONFERENCE OF THE AUSTRALIAN CEREBRAL PALSY ASSOCIATION—Western Australia, Mt. Lawley: The Spastic Welfare Association of Western Australia (40 Rockwood St.), 1960. 205 pp.

This small volume contains a wealth of empirical, anecdotal, and generally sound material on the diagnosis, treatment, and the educational and psychosocial needs of patients with cerebral palsy.

All the participants in the symposium were clearly experienced and well qualified in the field. However, the material is not very well organized and is largely unoriginal. An interesting feature of the presentation is that it took place in Australia.

In summary, although of historical interest, this publication probably would not be useful to most workers in the field who are familiar with the general literature.

BOOKS RECEIVED

Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.

AIR SAMPLING INSTRUMENTS—FOR EVALUATION OF ATMOSPHERIC CONTAMINANTS. Cincinnati, Ohio: American Conference of Governmental Industrial Hygienists, 1960. Price, $7.50.

AMERICANS VIEW THEIR MENTAL HEALTH. Gerald Burin; Joseph Veroff; and Sheila Feld. New York, N. Y.: Basic Books, 1960. 444 pp. Price, $7.50.

ANATOMY OF PSYCHOTHERAPY — SYSTEMS OF COMMUNICATION AND EXPECTATION. Henry L. Lennard and Arnold Bernstein. New York, N. Y.: Columbia University Press, 1960. 209 pp. Price, $6.00.

AND THE POOR GET CHILDREN. SEX, CONTRACEPTION, AND FAMILY PLANNING IN THE WORKING CLASS. Lee Rainwater. Chicago, Ill.: Quadrangle Books, 1960. 202 pp. Price, $3.95.

ANNUAL EPIDEMIOLOGICAL AND VITAL STATISTICS 1956. World Health Organization, Geneva, Switzerland. New York, N. Y.: Columbia University Press, 1959. 705 pp. Price, $12.00.

DESIGN AND CONSTRUCTION OF SANITARY AND STORM SEWERS. Washington, D. C.: Water Pollution Control Federation, 1960. 283 pp. Price, $7.00; $3.50 to Federation Members.

ESSENTIAL TREMOR—A CLINICAL AND GENETIC POPULATION STUDY. Tage Larsson and Torsten Sjogren. Copenhagen, Denmark: Ejnar Mungsgaard (Norregade 6), 1960. 176 pp. Price, 65 Danish kronor.

EXERCISE AND FITNESS. A Collection of Papers Presented at the Colloquium on Exercise and Fitness. Chicago, Ill.: Athletic Institute, 1960. 248 pp. Price, $3.00.

HOROWITZ LECTURES, 1958-1959, THE. Svend M. Clemmesen and Karl Harpuder. New York, N. Y.: Institute of Physical Medicine and Rehabilitation, 1960. Price, $1.00.

INTERNATIONAL BIBLIOGRAPHY OF SOCIOLOGY. Vol. VIII. Prepared by the International Committee for Social Sciences Documentation in cooperation with the International Sociological Association. New York, N. Y.: Columbia University Press, 1960. 319 pp. Price, $6.00.

MEDICINE TODAY—A REPORT ON A DECADE OF PROGRESS. Marguerite Clark. New York, N. Y.: Funk & Wagnalls, 1960. 360 pp. Price, $4.95.

MICROSCOPIC—ANALYTICAL METHODS IN FOOD AND DRUG CONTROL. Food and Drug Technical Bulletin No. 1. Washington, D. C.: Gov. Ptg. Office, 1960. 255 pp. Price, $2.00.

MILK SANITATION ADMINISTRATION. Selected Lectures from Course No. 333, February 16-20, 1959. Edited by Hugh E. Eagan. Washington, D. C.: Gov. Ptg. Office, 1960. 208 pp. Price, $1.25.

NATURE OF SCIENCE AND OTHER ESSAYS. David Greenwood. New York, N. Y.: Philosophical Library, 1959. 95 pp. Price, $3.75.

NEW HOPE FOR YOUR HAIR. Irwin I. Lubowe. New York, N. Y.: E. P. Dutton, 1960. 253 pp. Price, $3.95.

NEW METHOD FOR CYTOLOGICAL DIAGNOSIS OF PULMONARY CANCER. Annals of the New York Academy of Sciences, Vol. 84, Art. 5. Ludwig von Bertalanffy and Felix D. Bertalanffy. New York, N. Y.: The Academy, 1960. pp. 225-238.

NEWGOLD'S GUIDE TO MODERN HOBBIES, ARTS, AND CRAFTS. Bill Newgold. New York, N. Y.: David McKay, 1960. 289 pp. Price, $4.50.

NUTRITION REVIEWS. Volume 17, Numbers 1-12, January-December, 1959. New York, N. Y.: Nutrition Foundation, 1959. 382 pp. Price, $4.00.

NUTRITIONAL EVALUATION OF FOOD PROCESSING. Edited by Robert S. Harris and Harry Von Loesecke. New York, N. Y.: Wiley, 1960. 612 pp. Price, $12.00.

ORGANIZATION OF PSYCHIATRIC CARE AND PSYCHIATRIC RESEARCH IN THE UNION OF SOVIET SOCIALIST REPUBLICS. Annals of the New York Academy of Sciences. Vol 84, Art. 4. Nathan S. Kline. New York, N. Y.: The Academy, 1960. pp. 147-224. Price, $3.00.

PATIENT-CENTERED APPROACHES TO NURSING. Irene L. Beland and Ruth V. Matheney. New York, N. Y.: Macmillan, 1960. 205 pp. Price, $4.50.

PSYCHOANALYSIS AND CONTEMPORARY THOUGHT. Edited by John D. Sutherland. New York, N. Y.: Grove Press, 1960. 148 pp. Price, $1.45 paper; $3.45 cloth.

RADIOACTIVE FALLOUT IN TIME OF EMERGENCY —EFFECTS UPON AGRICULTURE. Washington, D. C.: U. S. Department of Agriculture, Agricultural Research Service, 1960. 43 pp.

SCHOOL HEALTH PRACTICE (2ND ED.). C. L. Anderson. St. Louis, Mo.: Mosby, 1960. 530 pp. Price, $6.00.

SCIENTIFIC PAPERS AND DISCUSSIONS. Divisional Meeting, Midwest Area District Branches American Psychiatric Association, Detroit, Mich., October 29-31, 1959. Edited by Jacques S. Gottlieb and Garfield Tourney. Washington, D. C.: American Psychiatric Association, 1960. 328 pp. Price, $3.00.

SEARCH FOR NEW ANTIBIOTICS. G. F. Gause. New Haven, Conn.: Yale University Press, 1960. 97 pp. Price, $4.75.

SHORT SYNOPSIS OF HUMAN PROTOZOOLOGY AND HELMINTHOLOGY. L. R. S. MacFarlane. Baltimore, Md.: Williams & Wilkins, 1960. 251 pp. Price, $7.50.

STORY OF CHEMISTRY. Georg Lockemann. New York, N. Y.: Philosophical Library, 1959. 277 pp. Price, $4.75.

THORACIC SURGERY BEFORE THE 20TH CENTURY. Lew A. Hochberg. New York, N. Y.: Vantage Press, 1960. 858 pp. Price, $15.00.

THYROID GLAND, THE. British Medical Bulletin, Vol. 16, Number 2, May, 1960. London, England: Medical Department, The British Council, 1960. pp. 89-174. Price, $3.25.

THYROID-VITAMIN APPROACH TO CHOLESTEROL ATHEROMATOSIS AND CHRONIC DISEASE—A TEN YEAR STUDY. Murray Israel. New York, N. Y.: Vascular Research Foundation, 1960. 132 pp.

WHEN YOUR HUSBAND RETIRES. Mollie Hart. New York, N. Y.: Appleton-Century-Crofts, 1960. 172 pp. Price, $3.50.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

Raymond S. Patterson, Ph.D., F.A.P.H.A.

That Weaker Sex! — "Women apparently withstand the effects of overweight better than men do. For every degree of overweight, the excess mortality among women is less than among men. For example . . ." The example and a lot of other thought-provoking statistics are worth hunting out. See the whole paper.

ANON. Mortality Among Overweight Women. Statist. Bull. Metrop. Life Insur. Co. 41, 3:1 (Mar.), 1960.

Making One's-Self Clear — If you aren't interested in this discussion of writing for the layman expounded by a famous medical editor and publicist, then your desire to "communicate" must be low indeed. Incidentally, the reading will do you a lot of good whatever your job may be—for you must have to talk or write to someone, sometime. Also, you'll like the paper that follows, "Unity and Communication in Science and the Health Professions" by the president of the AAAS.

ALVAREZ, W. C. The Art of Interpreting Medicine to the Layman. New York State J. Med. 60, 9:1490 (May 1), 1960.

Just to Know About—A veterinary school graduating class of 72 were given intradermal injections of inactivated duck-egg rabies vaccine. Though there were some reactions, none was serious, and three quarters of those who had all

three injections demonstrated neutralizing antibodies and booster doses later raised the titer. For people likely to be exposed to rabies.

ANDERSON, G. B., et al. Avian Embryo Rabies Immunization. Am. J. Hyg. 71, 2:158 (Mar.), 1960.

Teaching Teamwork—How can we go about creating the interprofessional teamwork we say is so vital to good public health practice in so many areas of health administration? This story of the way the seed of teamwork is planted at the Minnesota University School of Public Health was related at a (British) CCHE seminar. It should make provocative reading for educators here back home. Proving the pudding is the related account of the way health education is worked into the everyday job of student health supervision by the same sort of teamwork.

BOND, R. G. Health Education—A Multidisciplinary Approach. Health Ed. J. 18, 1:37 (Mar.), 1960.

Preventing Disability — The Surgeon General calls for a fresh view of disability as a preventable evil. He points to better ways through which the involved professions—medical care, public health, and rehabilitation—can work together to perfect preventive methods.

BURNEY, L. E. The Challenge of Disability. Pub. Health Rep. 75, 4:295 (Apr.), 1960.

What People Like—In a section of London, questionnaires were offered to the public, inviting opinions about the relative effectiveness of the various health educational media—among other matters. Television programs were thought by the respondents to be the most useful. Pamphlets were given a low place in their affections, as were exhibits. All the findings should be of some curiosity to any of us, on this side of the pond, who may be mulling over ways to "let the people know."

CHALKE, H. D. Public Opinion on Health Education. M. Officer 103, 17:239 (Apr. 22), 1960.

New-Style Resuscitation — The British call it "expired-air" resuscitation, which is a much prettier title than our "mouth-to-mouth." The tube they have designed has a mouth seal to cover the victim's lips, another esthetic—and sanitary—improvement.

COX, J., et al. Expired-Air Resuscitation. Lancet 7127:727 (Apr. 2), 1960.

Men of Good Will—Are you, or your organization, at all concerned about visual health? If so you will find this panel discussion of interest in more matters than ways to get an early-detection glaucoma clinic started. As one panelist said, "if you have good professional people in the community and organizations that will give good support, it is a very easy thing to organize." And the same considerations apply to many more hazards than glaucoma.

DAVID, W. D. Community Projects for the Early Detection of Glaucoma. Sight-Saving Rev. 30, 1:4 (Spring), 1960.

On Being Sure—Six good papers on the application of modern statistical methods to the solution of medical and health problems comprise a symposium of immediate importance to all who propose to attempt research. Aid in unraveling the natural history of any disease should be the prime function of statistical study and the papers here are developed from that point of view.

DENSEN, P. M., and BRESLOW, L. Statistical Problems in Medicine. J. Chronic Dis. 11, 5: 459 (May), 1960.

Polio in Central America—In the face of a Type 2 poliomyelitis epidemic 50 thousand-odd children in Managua were given live polio vaccine by mouth. No illness attributable to the vaccine was observed. All newborns since the

original prophylactic effort have been vaccinated. No paralytic poliomyelitis has been reported since the epidemic subsided, "a fact not observed in the preceding years."

DeSilva, M. M., et al. The Use of Attenuated Poliovirus in an Epidemic Area, Managua, Nicaragua, 1958. Am. J. Hyg. 71, 2:179 (Mar.), 1960.

And in Cuba—Twenty-five hundred children were given live polio vaccine without resulting nervous or other disturbances. The over-all conversion rate from seronegative to positive was 88 per cent.

Embil, J., Jr., et al. Response of Cuban Children to Oral Vaccination with Live Attenuated Poliovirus Vaccines. Brit. M. J. 5180: 1157 (Apr. 16), 1960.

Person or Case?—One striking feature of this analysis of methods, results, and factors that have influenced the outcome of reducing regimens is the wide and wild variety of questionable methods that have been acclaimed as successful over the years. The inquiry concludes that better results might have been attained if there had been less rigid devotion to concepts, drugs, and devices and more flexible attention given to the total status of the dieting patient.

Feinstein, A. R. The Treatment of Obesity. J. Chronic Dis. 11, 4:349 (Apr.), 1960.

Wycliffe Rose, et al. — History-minded readers of these dubious annotations will be delighted with these first-hand reminiscences of the early days of the International Health Board and its pioneering attacks on hookworm, yellow fever, and malaria. There is a wealth of informative detail here that has not yet found its way into the ordinary historical texts.

Hackett, L. W. Once Upon a Time. Am. J. Trop. Med. 9, 2:105 (Mar.), 1960.

First Graders' Hearts—This question is asked—should ausculation of the chest in the screening of school child examinations be discontinued in favor of information obtained from parents? The answer suggested by this Philadelphia experience is that it might well be. Are you interested?

Hubbard, J. P. Practice and Pitfalls in the Early Detection and Control of Heart Disease in Children. J. Pediat. 56, 4:544 (Apr.), 1960.

Example vs. Precept — Convinced that seat belts would have cut automobile accident fatalities by a quarter, the Berkeley (Calif.) City Health Department staff decided to do something themselves instead of telling others what to do. How the members equipped their cars that they use on official business and what effect their action has had are the burdens of the unusual report.

Leonard, A. R., et al. Introduction to Seat Belts. Pub. Health Rep. 75, 4:313 (Apr.), 1960.

Our Virus Enemies — For a fine over-view of the latest understanding of these elusive foes, this review paper is commended to your notice. Two decades ago there were 36 known viruses causing human diseases; since then 116 antigenically distinct strains have been added to the roster of public enemies. To keep them straight, a summing up, such as this one, helps a lot.

Rhodes, A. J. Recent Advances in Virus Infections: The New Era in Virology. Brit. M. J. 5179:1071 (Apr. 9), 1960.

Something to Think About—Statistical comparison, by states, suggests that some factor either present in hard water, or missing from, or entering in, soft water, appears to affect death rates from the degenerative cardiovascular diseases. The harder the healthier. Common sense tells you it should be just the other way around, for magnesium and related chemicals might be expected to clog human pipes too!

Schroder, H. A. Relation Between Mortality from Cardiovascular Disease and Treated Water Supplies. J.A.M.A. 172, 17:1902 (Apr. 23), 1960.

Midwives—Did you know that there are seven schools in our United States still offering courses in midwifery—to graduate nurses? And did you know that, though relatively few organizations or agencies offer opportunity for midwives to practice, the number of jobs open to nurse-midwives continues to grow? Did you know that in England 96 per cent of all babies are delivered by nurse-midwives?

WIDENBACH, E. Nurse-Midwifery—Purpose, Practice and Opportunity. Nursing Outlook 8, 3:256 (Mar.), 1960.

If additional information is desired regarding the articles listed in this bibliography, please communicate directly with the publication in which they appeared; the addresses are furnished for your convenience.

Am. J. Hyg. (American Journal of Hygiene), 615 N. Wolfe St., Baltimore 5, Md.
Am. J. Trop. Med. (American Journal of Tropical Medicine and Hygiene), Williams & Wilkins Co., Mt. Royal and Guilford Aves., Baltimore, Md.
Brit. M. J. (British Medical Journal), British Medical Association House, 19 Tavistock Sq., London, W.C.1, England.
Health Ed. J. (Health Education Journal), Tavistock House, Tavistock Sq., London, W.C.1, England.
J.A.M.A. (Journal of the American Medical Association), 535 N. Dearborn St., Chicago, Ill.
J. Chronic Dis. (Journal of Chronic Diseases), C. V. Mosby, 3207 Washington Blvd., St. Louis 3, Mo.
J. Pediat. (Journal of Pediatrics), C. V. Mosby, 3207 Washington Blvd., St. Louis 3, Mo.
Lancet, 7 Adams St., Adelphi, London, W.C.2, England.
M. Officer (Medical Officer), Chronicle House, 72-78 Fleet St., London, E.C.4, England.
New York State J. Med. (New York State Journal of Medicine), 386 Fourth Ave., New York, N. Y.
Nursing Outlook, American Journal of Nursing Company, 10 Columbus Circle, New York, N. Y.
Pub. Health Rep. (Public Health Reports), Gov. Ptg. Office, Washington, D. C.
Sight-Saving Rev. (Sight-Saving Review), National Society for the Prevention of Blindness, Inc., 1790 Broadway, New York 19, N. Y.
Statist. Bull. Metrop. Life Insur. Co. (Statistical Bulletin of the Metropolitan Life Insurance Company), One Madison Avenue, New York 10, N. Y.

CREDIT LINES

The Journal cannot furnish copies of items mentioned in Credit Lines. Please send requests to addresses given.

Health Insuring the Aged Abroad

"Medical Benefits for Pensioners Under Foreign Social Security Programs" (Social Security Bulletin, January, 1960) should help throw more light on the American debate on how to finance medical care for the aged.

Authors Daniel S. Gerig and Carl H. Farman separate the 56 countries abroad with some type of statutory old-age benefit system into six categories with respect to eligibility for medical benefits.

"The six groups represent countries that (1) cover old-age insurance beneficiaries under sickness insurance, without payment of contribution; (2) cover old-age insurance beneficiaries under sickness insurance but require them to contribute; (3) permit old-age pensioners to insure voluntarily under sickness insurance; (4) cover all residents, including pensioners, under a medical care or sickness insurance program; (5) cover pensioners under other arrangements; and (6) either do not cover old-age beneficiaries or pensioners under their sickness insurance program or do not have such a program."

The 12 countries which make old-age insurance beneficiaries specifically eligible for medical benefits in the program without requiring further contributions of them after retirement are Belgium, France, the Federal Republic of Germany, Greece, and Italy in Western Europe; and Albania, Czechoslovakia, East Germany, Hungary, Poland, Rumania, and Yugoslavia in Eastern Europe.

Six countries require contributory payments from pensioners after retirement—Austria, Chile, Luxembourg, Mexico, Panama, and Spain.

Pensioners are permitted to make contributions to insure themselves voluntarily under the public sickness insurance program in Denmark, the Netherlands, Peru, and Switzerland.

In another group of countries all residents regardless of age are eligible for comprehensive medical benefits. Australia, Bulgaria, Iceland, New Zealand, Norway, Sweden, the USSR, and the United Kingdom are in this category ("although their programs differ considerably in some respects").

In Iceland, Canada, and Japan social security beneficiaries receive medical benefits "under certain circumstances" —for example, according to income level after retirement, or via an insurance mechanism separate from the pension program.

Bolivia, Brazil, Communist China, Costa Rica, the Dominican Republic, Ecuador, Iran, Nationalist China, Nicaragua, Paraguay, Portugal, and Turkey maintain old-age insurance and sickness insurance programs but do not cover old-age beneficiaries for medical benefits. Argentina, Ceylon, Cuba, Finland, Iraq, Israel, Malaya, the Philippines, the Union of South Africa, the United Arab Republic, and Uruguay have some kind of pension program for the aged, but no provisions for assistance in the event of illness. "In Israel and Cuba, however, fairly extensive voluntary sickness insurance programs are in operation."

The authors briefly describe the benefit patterns in the various systems through which medical care is available. Generalizing, they note that these "commonly include general practitioner care, hospitalization, essential medicines, some laboratory services and dental treatment."

Single copies of the Social Security Bulletin from the Government Printing Office, Washington 25, D. C.; 25 cents.

(EDITOR'S NOTE: Somewhat germane to our national debate also is an article in the April, 1960, Bulletin, "Unmet Need in Public Assistance," by Ellen J. Perkins of SSA's Division of Program Research. In the area of medical care, the increased expenditures needed are "conservatively" estimated at $322 million a year, of which $268 million is needed for those on old-age assistance. "Estimates included for medical care are related not to need for such care but to present costs under the State public assistance programs." The author's is a thought-provoking approach. The estimates "show how much public assistance expenditures for medical care would increase if all states provided such care in the scope and at the median monthly cost per recipient reported by states with assistance costs for medical care above the national median in December, 1958.")

Nuclear Congress Papers Available

Sixty-two technical papers were presented at the 1960 Nuclear Congress in New York City in April. Twenty-eight engineering and scientific organizations took part in the congress, including the American Public Health Association, which sponsored one of the technical sessions. Reprints of the papers are now available at 50 cents each or $20 for the complete set. Catalog from 1960 Nuclear Congress, 29 West 39th Street, New York 18, N. Y.

Annual Reports

An unusual make-up distinguishes the annual report of the Cook County (Ill.) Department of Public Health. Most of its glossy 8½ x 11 pages are given over to photographs entirely, most of them without caption. Bound inserts of 4 x 11 sheets carry the text—a brief explanation of services rendered to the community.

The title of the report is "An Investment in People." This can be interpreted as including health workers as well as the public they serve. Thus, two of the 4 x 11 sheets are given over to a listing of staff. Noted by an asterisk are those who resigned from employment during 1959. This not only gives recognition to those who served during the year but for various reasons have left the department; it may also be a quiet way of telling Chicago's suburban community of some of the continuing efforts required to maintain the health department's reservoir of qualified personnel. (For example, among the 32 public health nurses named, nine resigned during 1959.) The department has a budget of about 53 cents per person and notes that "experience throughout the nation indicates that a minimum of $1.50 per person annually is needed to provide a reasonably well rounded public health service."

For 15 of its 20 years, organized public health service in the county has been within the Department of Public Health. Before that it was administered through a unit of the Bureau of Public Welfare.

The inside back cover is a series of squibs on what people are "talking about . . . in the suburbs." For example, the health department has been working with "local groups in interpreting the department's services and giving assistance in community organization." This is tantalizingly brief. Perhaps there is a good story hidden here to be told in the 1960 report?

The director for health, Cook County (Ill.), is John B. Hall, M.D., M.P.H.

"Health services cost each Puebloan $1.58 during 1959" according to the annual report of the Pueblo (Colo.) City-County Health Department. This figure is exclusive of expenditures involved in the county's medical care, mental health and mental retardation programs.

The city's indigent medical care program, said to be unique in Colorado,

gets first page treatment in the tabloid-sized report. Some 4,000 persons are eligible for its services given in the new health center and headed, since July, 1959, by a full-time physician-director. These are really two programs operated as one. It covers persons eligible for public assistance from the welfare department who formerly got care through the county physician's office. And it covers the medically indigent—this aspect of the program being supported by contributions to the Pueblo Single Fund, Inc., which make possible the operation of the Community Clinic. Both programs had been operated with part-time professional staff. "It seemed logical to combine staffs and equipment and utilize the better facilities offered at the new . . . Health Department building . . . when a full-time doctor could be found." He is Donald St. John, M.D.

Pueblo's Mental Retardation Clinic financed by the Children's Bureau is also located at the new health center. During 1959, 21 children were referred, all by family physicians, who in turn received complete reports when evaluations had been made. Work-ups at the clinic include social studies of the child and his family constellation, psychological evaluation, home observations by a public health nurse, neurological, speech and hearing and complete physical examinations, laboratory studies, dietetic interview and other tests indicated. This intensive study and the frequent checks and re-evaluation services provided—and necessary for research and prognostic purposes—are given without charge to the family. The Health Department conducts a speakers bureau and publicizes it. In a community estimated to have 130,000 people, health educators and other staff personnel spoke before 64 groups in 1959. Radio Station KAPI carried a report of daily health activities in Pueblo. One would like to have more information on this.

The eight-page report, printed as a newspaper version of the department's Health Reporter, is complete with editorials and cartoons. The latter are for statistical presentations. The births column is labeled "Heaven Sent" (picture: infants lolling about on clouds)—the deaths, "Heaven Bent," with Father Time (no scythe) writing in the book.

John S. Anderson, M.D., M.P.H., is health officer, F. G. Tice, M.D., assistant health officer, and Albert J. Klimaszewski, M.S.P.H., is health educator.

Another eight-page tabloid-sized annual report, this one actually printed by a daily newspaper (the Times Herald, Olean, N. Y.), was published in February by the Cattaraugus (N. Y.) County Health Department. Another daily and ten weeklies in the area agreed to circulate the report, all on the same day, in a cooperative attempt to get it into the 37,000 homes in the county. (The Times Herald printed the mastheads of these 11 newspapers on the copies which they agreed to circulate). A member of the Times Herald editorial staff edited the supplement, with first drafts and artwork being supplied by the Health Department. The combined effort results in a series of short readable articles not heavily burdened with dry technicality on each of the agency's divisions.

Ian D. McLaren, M.D., M.P.H., commissioner of health, shares columns one and two on the first page with B. J. Wilkinson, president of the Board of Health. The health officer's article is " 'Spectrum of Life' Reflects Health in Cattaraugus County." The latter addresses himself to "The Honorable Board of Supervisors."

New York State Legislators received copies of the report through the cooperation of the New York State Department of Health.

NEWS FROM THE FIELD

WHO News

Personal Gifts to WHO Fund

A Danish citizen living in Portugal has contributed $7,275 to WHO's Malaria Eradication Special Fund. The donor, Mrs. I. Lonborg-Madsen, expressed hope that the money could be spent for projects in Africa. Mrs. Lonborg-Madsen and her late husband lived for several years in Africa and there learned of the disastrous effects of the disease in human suffering and in economic loss. The gift supplements an official contribution to the fund already received by the WHO Regional Office for Europe (Copenhagen) from the government of Denmark.

WHO states that her donation "is of particular value to the organization because it is one of the first examples of individual interest and support for this program, designed to rid the world of one of its greatest scourges."

Another similar example of valued interest cited by WHO was a check for $200 presented to the same fund by the students of George Washington High School, New York City. The presentation was made at the school's own World Health Assembly, held as a climax to film showings on world health activities and other informational and fund-raising gatherings organized by the school's UN Club.

World Health Assembly Elects

The thirteenth World Health Assembly opened its three-week session on May 3 at the World Health Organization's headquarters in Geneva and in its first action elected Dr. H. B. Turbott, director-general of health of New Zealand, as its president, by acclamation, Dr. Y. Ben Abbes of Morocco, Professor R. Baranski, Poland, and Dr. J. M. Baena, Colombia, were elected vice-presidents.

Early in its deliberations the World Health Assembly elected Cameroun, the Sheikdom of Kuwait, and the Republic of Togo to full membership in WHO. New associate members are Cyprus, the Federation of Mali, and six nations of the French Community—the Central African Republic, the Republic of the Congo, the Republic of the Ivory Coast, the Gabon Republic, the Republic of the Upper Volta, and the Republic of the Niger. These new admissions bring to 101 the total number of full and associate members of WHO.

In a welcome to the new members, A. Asumda of Ghana spoke of the wave of nationalism sweeping over Africa. "WHO should look forward to many more applications for membership from the African Region," he said.

Delegates and advisers representing the United States at the Assembly were:

Leroy E. Burney, M.D., Surgeon General, U.S.P.H.S.

H. E. Henderson, Deputy Assistant Secretary of State for International Organization Affairs

F. B. Berry, M.D., Assistant Secretary of Defense (Health and Medical)

L. T. Coggeshall, M.D., dean, Division of Biological Sciences, University of Chicago

H. van Zile Hyde, M.D., assistant to Surgeon General for International Health

R. K. C. Lee, M.D., director of health, State of Hawaii

G. Arbona, M.D., secretary of health of the Commonwealth of Puerto Rico

E. P. Campbell, M.D., chief, Public Health Division, International Cooperation Administration

G. Edsall, M.D., director, Division of Communicable Disease, Walter Reed Army Intitute of Research

E. R. Jenney, M.D., assistant chief, Division of International Health, Public Health Service

B. F. Mattison, M.D., executive director, American Public Health Association

C. A. Nafe, M.D., Board of Trustees, American Medical Association

C. Parnall, Jr., M.D., administrator, Rochester (N. Y.) General Hospital

Allen Pond, Office of the Special Assistant, for Health and Medical Affairs, HEW

Edward J. Rowell, Attache, United States Resident Delegation and Consulate General, Geneva

W. T. Sowder, M.D., state health officer, Florida State Board of Health

Laurence R. Wyatt, Office of International Economic and Social Affairs, Department of State

Three New Technical Reports

"Insecticide Resistance and Vector Control" (Tenth Report of the Expert Committee on Insecticides, 60 cents) is principally concerned with the practical problems of combating resistance to insecticides, especially with the establishment of standard test methods for determining the susceptibility or resistance of insects. The report notes the modifications that have been introduced in the procedures for adult and larval mosquitoes on the basis of recent experience. The committee defines and discusses the use of the term "behaviouristic resistance." In the strict sense, this should be reserved for populations the behavior of which has been changed by selection in avoiding lethal doses of an insecticide. One of the eight annexes to the report is a revised version of "Recommended methods for vector control."

The Expert Committee on Biological Standardization (Thirteenth Report, no other title, 30 cents) has again examined a wide range of substances of importance in treatment, prophylaxis, and diagnosis and reports the establishment of international reference preparations of amphotericin B, kanamycin, vancomycin, viomycin, human menopausal gonadotrophin, vitamin B_{12}, and egg lecithin, as well as international standards for anti-streptolysin O, and swine erysipelas vaccine. (Work aimed at establishing international reference preparations of various vaccines and sera is under way.) The report outlines the committee's plans for establishing international reference preparations and standards for a wide variety of diagnostic reagents in conjunction with the expending activities of WHO in the field of medical research. It recommends that this work should first concentrate on sera used in the grouping and typing of viruses. The list of International Standards and International Reference Preparations held for distribution at the International Laboratories for Biological Standards in Copenhagen and in London has been brought up to date.

The WHO Study Group on Appraisals of Fellowships (1960 Report, no other title, 30 cents) examines the problems confronting administrators planning appraisal of fellowship schemes in the field of health, and suggests criteria for appraisal. A precise statement of the objectives of a fellowship is a prerequisite for any satisfactory appraisal. The report analyzes the various methods of appraisal and discusses their values in certain types of fellowships and programs, depending on objectives. The group recognizes that, as with evaluation of other educational processes, considerable work must be done in developing criteria and other methodology of appraisal. Paulo Cesar de Azevedo Antunes, M.D., of Sao Paulo, Brazil, vice-president, APHA, was chairman of the group.

Available from Columbia University Press, 2960 Broadway, New York 27, N. Y.

Scottish Experiment in Better Care

The Health Bulletin of the Department of Health for Scotland (April, 1960) reports on the first six months' experience of its Family Doctor Centre in Edinburgh, an experiment in providing certain diagnostic facilities for practi-

tioners in the City of Edinburgh. Those physicians who use the center continue to carry on their day-to-day consulting in their own offices but are able to make arrangements for the special examination of obscure and difficult cases they meet in their practice by making an appointment for them at the center where special investigations can be carried out. The center offers a wide range of diagnostic procedures and provides laboratory, x-ray and electrocardiographic services, thus enabling general practitioners themselves to deal with many types of cases which otherwise they would have to refer to hospital outpatient departments. A senior physician acts in an honorary capacity and is available as medical adviser in appropriate cases. Social workers also assist in dealing with the numerous medico-social problems encountered in general practice.

When the center was first opened in June, 1959, the number of general practitioners using it was limited to a maximum of 40, but an invitation has now been extended to all general practitioners in the city to use the center. As of December 31, 1959, a total of 350 cases had been referred and 411 x-ray examinations of various kinds done on 257 patients. Hematological, bacteriological and biochemical examinations undertaken at the center total, for the same period, 346. The medico-social worker has, where necessary, paid home visits and carried out other interviews as required.

Haven Emerson Memorial Plaque

A memorial plaque honoring the late Haven Emerson, M.D., was dedicated on April 22 during the 1960 annual meeting of the Association of the Alumni of Columbia University's School of Public Health and Administrative Medicine held on the campus. The plaque, to be placed in the students' lounge at the school, honors Dr. Emerson's 19 years of direction and inspiration of the school to which he was the first faculty appointee.

At the dedication, Fred B. Rogers, M.D., M.P.H., associate professor of preventive medicine and public health, Temple University School of Medicine, Philadelphia, speaking as head of the Alumni Association, took the audience of some 200 persons on what Dr. Leona Baumgartner later called an airplane trip over the main facts of Dr. Emerson's professional life. Ray E. Trussell, M.D., M.P.H., chairman of the school, paid his tribute to Dr. Emerson's influence upon the more recent students at the school who were not able to know him personally. Leona Baumgartner, M.D., New York City health commissioner, spoke in behalf of Dr. Emerson's many colleagues in many fields. His unerring instincts for seizing upon the basic point of a problem, his single-minded devotion to a cause, the catholicity of his interests, the clarity and elegance of his speech, his boundless energy, and, above all, his humanity—these were in her moving tribute.

Also at this annual meeting, the Haven Emerson Memorial Fund was announced. This has been "established to aid students in financial difficulty during their period of enrollment in the School of Public Health and Administrative Medicine."

Improving Patient Safety

The Food and Drug Administration has begun a program for the reporting of unusual or adverse reactions to drugs in cooperation with a limited number of hospitals representing a cross-section of medical specialties. Additional hospitals will be included as the program develops with the aim of establishing nation-wide reporting. The project is an outgrowth of a voluntary pilot study carried out during the past four years in coopera-

tion with the American Association of Medical Record Librarians, the American Society of Hospital Pharmacists, the American Medical Association, and the American Hospital Association.

Before release for general use, new drugs, by law, must be evaluated for safety by the Bureau of Medicine of the Food and Drug Administration. FDA reports that "Notwithstanding a most careful check of the submitted data, wide clinical use may bring to light effects not apparent in the investigative studies. When these become known, appropriate measures are taken to afford a greater degree of patient protection."

In the past, FDA has "had to rely on the published literature and sporadic reports from physicians, institutions and pharmaceutical manufacturers to supplement its own small staff in following up on experience with new drugs."

Two County Programs Judged Best

The Marion County (Ind.) Health Department, which includes the city of Indianapolis, has won the Samuel J. Crumbine Award for outstanding achievement in the development of a program of eating and drinking sanitation. The County Health Department of San Bernardino, Calif., received the Crumbine Award for the development of a comprehensive program of environmental sanitation. The annual competition for these top national sanitation awards is sponsored by the Public Health Committee of the Paper Cup and Container Institute and is open to more than 1,200 local health departments throughout the country.

Henry G. Nester, M.D., director of public health in Marion County, accepted the award for the department at the National Restaurant Association Convention in Chicago in May. Bronze medallions for personal leadership in the program went to Dr. Nester, to Alfred L. Klatte, director, Bureau of Environmental Sanitation, and to Siegel Osborn, supervisor, Food Section.

Malcolm H. Merrill, M.D., California state health director, and president of the American Public Health Association, presented the plaque honoring the San Bernardino County Health Department to M. E. Cosand, M.D., health officer, at the annual meeting of the Western Branch of the American Public Health Association in Denver, Colo., in May. Dr. Cosand and Richard E. Elliott, director, Sanitation Services, received bronze medallions for program leadership.

Invitation to Veterinarians

The Conference of Public Health Veterinarians will hold a business meeting in conjunction with the annual meeting of the American Veterinary Medical Association in Denver, Colo., 2:30-4:00 p.m., Sunday, August 14, 1960. The meeting will be open to all veterinarians interested in public health. Joe W. Atkinson, D.V.M., is secretary-treasurer of CPHV, with offices at NIH Laboratory Aids Branch, Bethesda 14, Md.

The Going Cost, $4 Million

Kentucky's State Department of Health moved early in April from Louisville to its new $2,750,000 plant in Frankfurt. According to Russell E. Teague, M.D., M.P.H., health commissioner, no public health program was interrupted by the move. The agency did, however, have to reckon with the loss of personnel who resigned because they did not wish to change their place of residence. The new facility includes a 440-seat auditorium, stacks for an 18,000 volume library, and 35,000 square feet for laboratories. Funds for additional construction become available in July. When this is completed the total capital investment will approximate $4 million.

The Georgia Department of Public Health moved into its new $4,175,000 headquarters in May. This was an in-town move (from Capitol Square to Trinity Ave., Atlanta). This will bring all of the services performed by the department's Atlanta based personnel together for the first time in many years; the department's three divisions, Administration and Finance, Physical Health, and Mental Health will be under the same roof. One of the special features of the building is an air lock entrance to the laboratory in which highly infectious organisms are to be studied. Ultraviolet light and a system of automatic locks in the vestibule to this room prevent spread of infection.

Nurses Elect National Officers

Delegates to the 42nd convention of the American Nurses' Association meeting early in May at Miami Beach, re-elected Mathilda Scheuer, R.N., of Philadelphia, as ANA president. More than 6,000 nurses from this country and abroad were registered for the biennial meeting of the association. Other ANA officers elected were:

First Vice-President—Mary C. Walker, R.N., director of nursing services, Denver Red Cross

Second Vice-President — Margaret B. Dolan, R.N., chairman, Department of Public Health Nursing, University of North Carolina School of Public Health

Third Vice-President — Georgia B. Nyland, R.N., assistant head nurse, Indiana University Medical Center, Indianapolis

Secretary—Julie M. Carnahan, R.N., supervisor, Ochsner Clinic, New Orleans (re-elected)

Treasurer—Louise Alcott, R. N., executive secretary, Arizona State Nurses Association, Phoenix.

Miss Scheuer and Mrs. Dolan are Fellows of the American Public Health Association. ANA offices are at 10 Columbus Circle, New York 19, N. Y.

Four Personnel Changes at NIH

Joseph E. Smadel, M.D., formerly associate director for Intramural Research, is now chief of the Laboratory of Virology and Rickettsiology in the Division of Biologics Standards of the National Institutes of Health.

G. Burroughs Mider, M.D., replaced Dr. Smadel with the new title of director of laboratories and clinics.

Jack Masur, M.D., formerly director of the clinical center, has become associate director for Clinical Care Administration.

Ernest M. Allen, Ph.D., formerly chief of the Division of Research Grants, has become associate director for research grants.

The changes became effective July 1.

P.S. on Oral Polio Vaccine Trials

The April Journal reported that the first mass oral polio vaccine project in the country had begun in Florida's Dade County. Its goal was to eradicate the disease among county residents, numbering some 500,000 persons under age 40. University of Miami, one of the project sponsors, now reports that in the two-month project over 403,000 people received a single oral feeding of polio vaccine. Preliminary studies show that over 90 per cent of them received definite protection against Types I and III polio, and 80 per cent against Type II. No evidence of harm to the individual or the community has been observed as a result of the field trial.

M. Eugene Flipse, M.D., professor of preventive medicine at the University of Miami School of Medicine, reported the "overwhelming success of the oral polio vaccine in the massive field trial" in an address before the Soviet-American meeting on poliomyelitis in Moscow (May 12-20).

Before the immunization program got under way, the immune status of the

population was determined by a random sampling of 1,499 households, including 4,630 individuals. From mid-February to late April, the entire Dade County population was alerted to the availability of the vaccine through the press, radio and television, churches, pharmacies, business firms, and schools.

There have been five cases of polio in Dade County in 1960, three of them in people who had taken the oral polio vaccine. Two had received the vaccine eight days before onset of polio, and one 13 days before—too soon for immunity to have developed. One patient had Type III polio, two had Types I and III. In no case was Type II poliovirus isolated.

PERSONALS

LEO BERNSTEIN, M.D., M.P.H.,† formerly assistant health executive of Hawaii's Health Department, is now deputy director of health, and director, Division of Local Health Services, State Department of Health, Hawaii.

JULIA P. BRANDEBERRY, R.N., M.P.H.,† formerly nurse consultant, is now chief, Public Health Nursing Section, Michigan Department of Health, succeeding HELENE B. BUCKER, R.N.,* retired.

LOWELL T. COGGESHALL, M.D.,* has been appointed vice-president (for medical research programs) University of Chicago. He will continue to serve as dean of the university's Division of Biological Sciences pending appointment of a successor.

GILBEART H. COLLINGS, JR., M.D., M.P.H.,* formerly associate medical director, Standard Oil Company (Indiana), with offices in Chicago, is now medical director, succeeding BRYCE B. REEVE, M.D., retired.

HENRY EISENBERG, M.D., M.P.H.,* since 1954 public health internist, Connecticut State Department of Health, Hartford, is now chief of the department's Chronic Disease Control Section, succeeding MATTHEW H. GRISWOLD, M.D., Dr.P.H.,* who retired after 23 years' service.

SIDNEY FARBER, M.D.,† professor of pathology, Harvard Medical School, Boston, and director of research, Children's Cancer Research Foundation, delivered the Ninth Annual Ira I. Kaplan Lecture in May, at New York University School of Medicine, on "Biological and Therapeutic Considerations of Cancer in Early Life."

JOSEPH C. FINNEY, M.D., formerly head, Community Mental Health Clinic, Champaign County, Ill., is now research director, Division of Mental Health, State Department of Health, Hawaii.

JOHN E. FLETCHER,† formerly director, Research Information Office, National Institutes of Health, Bethesda, is now head of public relations, Merck Sharp & Dohme, West Point, Pa.

BENJAMIN FREEDMAN, M.D., M.P.H., formerly assistant director, Mount View Hospital, Lockport (N. Y.), and more recently in private practice as a specialist in internal medicine, Troy (N. Y.), is now associate compensation examining physician, New York State Workmen's Compensation Board, with offices in Albany.

MILTON W. HAMILT,† formerly assistant director, Sinai Hospital, Baltimore, is now assistant director, Mount Sinai Hospital, Chicago.

ROBERT F. HANSEN, M.D., M.P.H.,† formerly chief, PHS Regional Office Division of Special Health Services, Denver, is now chief, Special Health Services, PHS Regional Office, Atlanta.

NATHAN C. HANSON,† formerly field representative, California Heart Association, is now executive director, Wyoming Heart Association, with offices in Sheridan.

HALSTED R. HOLMAN, M.D., formerly with the Rockefeller Institute for Medical Research in New York City, is now Guggenheim professor (the first) and executive, Department of Medicine, Stanford University School of Medicine, Palo Alto, Calif.

J. GARTH JOHNSON, Ph.D.,† associate professor of preventive medicine, Department of Preventive Medicine and Public Health, Albany Medical College, has retired as editor of the Association of Teachers of Preventive Medicine Newsletter. DUNCAN W. CLARK, M.D.,* professor and executive officer, State University of New York College of Medicine, Brooklyn, is his successor.

JANE JONES,† formerly director of health education, Massachusetts Division, American Cancer Society, is now health educator, Brookline (Mass.) Health Department, succeeding JOHN MCCORMICK† now serving as project coordinator for the Brookline Health Department, which is undertaking a two-year study in the field of aging, with a grant from the National Institutes of Health.

* Fellow.
† Member.

EDMUND KLINE, Dr.P.H.,* director, Laboratory Division, Cattaraugus County (N. Y.) Health Department, retired in May to be succeeded by LEO D. MOSS, M.D.,† Olean, N. Y., pathologist. Assistant director is PAUL FUGAZZOTTO, Ph.D.,*

GRANVILLE W. LARIMORE, M.D., M.P.H.,* deputy commissioner, New York State Department of Health, has been appointed chairman of the 1961 National Health Forum to be held in New York City March 13-16, 1961, on "Health and Communication."

SARA MAZELIS,† formerly health education consultant, Bureau of Health Education, California State Health Department, is now educational director, California Division, American Cancer Society.

KARL F. MEYER, M.D., Ph.D.,* director emeritus, George Williams Hooper Foundation for Medical Research, professor emeritus of experimental pathology, University of California, and 1951 APHA Lasker Award winner, has received the 1960 Howard Taylor Ricketts Memorial Award of the University of Chicago.

DANIEL A. OKUN, Sc.D.,* professor and head, Department of Sanitary Engineering, University of North Carolina School of Public Health, will be at the Research Institute of Public Health Engineering, Technological University, Delft, The Hague, as a National Science Foundation Senior Postdoctoral Fellow, in the 1960-1961 academic year.

ELIZABETH PEABODY, M.D., for the past two years with the PHS Division of Foreign Quarantine (Athens and Paris), has been reappointed to her former position as medical director, Region IV (Atlanta), Children's Bureau.

MARGUERITE J. QUENEAU,* retired nutritionist, formerly with the New York State Department of Health, has by resolution been elected an honorary member of the New York State Nutrition Council "for the devotion (she) has given to the people of New York State and to her professional colleagues."

WILLIAM REYNOLDS, M.D., M.P.H.,† formerly professor and chairman of Preventive Medicine and Public Health, University of Washington, Seattle, is now chief of Research Training, California State Health Department, Berkeley.

JAMES W. SAMPSON, M.D.,† director, Wyoming State Health Department, returned to Wyoming on June 1 after completing work for the master of public health degree at the University of California, Berkeley. HENRY W. KASSEL, M.D.,* acting director during Dr. Sampson's academic leave of absence, has returned to the Public Health Service Regional Office (Region VIII) in Denver as chief of general health services.

WILLIAM MORRIS SCHMIDT, M.D.,* formerly associate professor, Department of Maternal and Child Health, Harvard School of Public Health, is now professor and head of the department, succeeding MARTHA MAY ELIOT, M.D.,* now professor of maternal and child health, emerita.

GEORGE F. SCHNACK, M.D., formerly associate director, Rockland County (N. Y.) Center for Mental Health, is now head, Lanakila Mental Health Clinic, State of Hawaii Department of Health, Hawaii.

DEAN F. SMILEY, M.D.,* Evansville (Ill.), secretary, Association of American Medical Colleges, received the 12th annual alumnus award of Cornell University Medical College for his "outstanding contributions to medicine."

LAMAR SOUTTER, M.D., professor of surgery, and since September, 1959, acting dean, is now dean, Boston University School of Medicine.

ERNEST L. STEBBINS, M.D., M.P.H.,* dean, School of Hygiene and Public Health, Johns Hopkins University, Baltimore, has received the Drake University, Des Moines, Alumni Distinguished Service Award in recognition of the honor he has brought to the university through his career and service to society.

MILTON TERRIS, M.D., M.P.H.,* formerly professor of epidemiology, Department of Tropical Medicine and Public Health, Tulane University, New Orleans, is now head, Chronic Disease Unit, Division of Epidemiology, Public Health Research Institute of the City of New York.

JOHN E. VOGT, M.P.H.,† formerly acting director, Division of Engineering, Michigan Department of Health, is now director, succeeding WILLARD F. SHEPARD,† retired.

MERLE WHORLOW, M.P.H.,* formerly with the Michigan State Health Department, is now director of a study of health education in the Los Angeles County Schools, sponsored by the Health Division, Los Angeles Welfare Planning Council.

S. BERNARD WORTIS, M.D., formerly chairman, Department of Psychiatry and Neurology, New York University Medical Center, is now dean of the New York University School of Medicine and Post-Graduate Medical School, and deputy director of the center, succeeding DONAL SHEEHAN, M.D.

* Fellow.
† Member.

EVELYN ZETTER, R.N.,† formerly assistant director and field service consultant, is now director, National League for Nursing, Department of Hospital Nursing, succeeding MARGARET GIFFIN ELLSWORTH.

DEATHS

J. LEWIS AMSTER, M.D.,* chairman, Public Health Committee, Bronx (N. Y.) Board of Trade (Medical Care Section).

MORRIS GREENBERG, M.D., M.S.P.H.,* director, Bureau of Preventable Diseases, New York City Department of Health on May 25 (Epidemiology Section).

FLOYD W. MOHLMAN, Ph.D.,† of Pacific Palisades, Calif., who was the advisory editor of the "Journal of Water Pollution Control Federation" on May 2 (Engineering and Sanitation Section).

ADRIENNE C. PROSKINE,† director of nurses, City Department of Health, Schenectady, N. Y. (Nursing Section).

COLONEL MATHAIS F. REGNER, M.C.,† affiliated with the Central Medical Group, New York, N. Y., in November, 1959 (Unaffiliated).

EARL M. STRADER,† sanitarian, Wichita-Sedgwick (Kans.) Health Department (Engineering and Sanitation Section).

HOWARD A. STREETER, M.D.,* of Manchester, N. H. (Health Officers Section).

CONFERENCES AND DATES

American Public Health Association, Eighty-Eighth Annual Meeting, San Francisco, Calif. October 31–November 4.

Eighty-Ninth Annual Meeting, Detroit, Mich. November 13–17, 1961.

State and Regional Public Health Meetings—July, August, and September:

Minnesota Public Health Association. Lowry Hotel, St. Paul. September 29–30.

New England Health Institute. Equinox House, Manchester, Vt. July 11–13.

Nebraska Public Health Association. Fontenelle Hotel, Omaha. September 28–30.

North Carolina Public Health Association. Washington Duke Hotel, Durham. September 7–9.

Oregon Public Health Association. Marion Hotel, Salem. September 29–October 1.

Pennsylvania Public Health Association. University Park Hotel, University Park. Week of August 15.

South Dakota Public Health Association. Sheraton Johnson Hotel, Rapid City, S. D. September 14–16.

Meetings of Other Organizations:

American Hospital Association. San Francisco, Calif. August 29–September 1.

American Osteopathic Association. Hotel Muehlebach, Kansas City, Mo. July 18–22.

American Pharmaceutical Association. Shoreham Hotel, Washington, D. C. Week of August 14.

International Congress for Internal Medicine. Basel, Switzerland. August 24–27.

International Congress of Histochemistry and Cytochemistry (First). Paris, France. August 28–September 3.

International Congress on Occupational Medicine. Waldorf Astoria Hotel, New York, N. Y. July 25–29.

International Society for the Welfare of Cripples. Waldorf Astoria Hotel, New York, N. Y. August 28–September 1.

National Association of Sanitarians. Jack Tar Hotel, San Francisco, Calif. July 18-22.

National Cancer Conference (Fourth). Minneapolis, Minn. September 13–15.

National Medical Association. Hotel Penn-Sheraton, Pittsburgh, Pa. August 8–11.

National Society for Crippled Children and Adults with ISWC Eighth World Congress. Waldorf Astoria Hotel, New York, N. Y. August 28–September 2.

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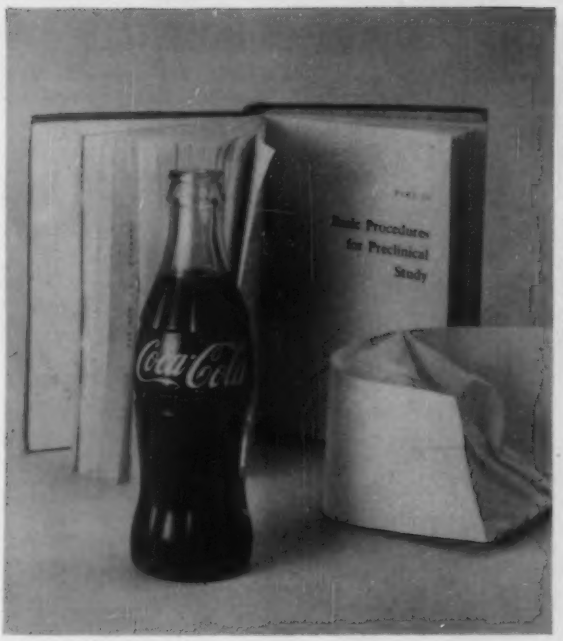

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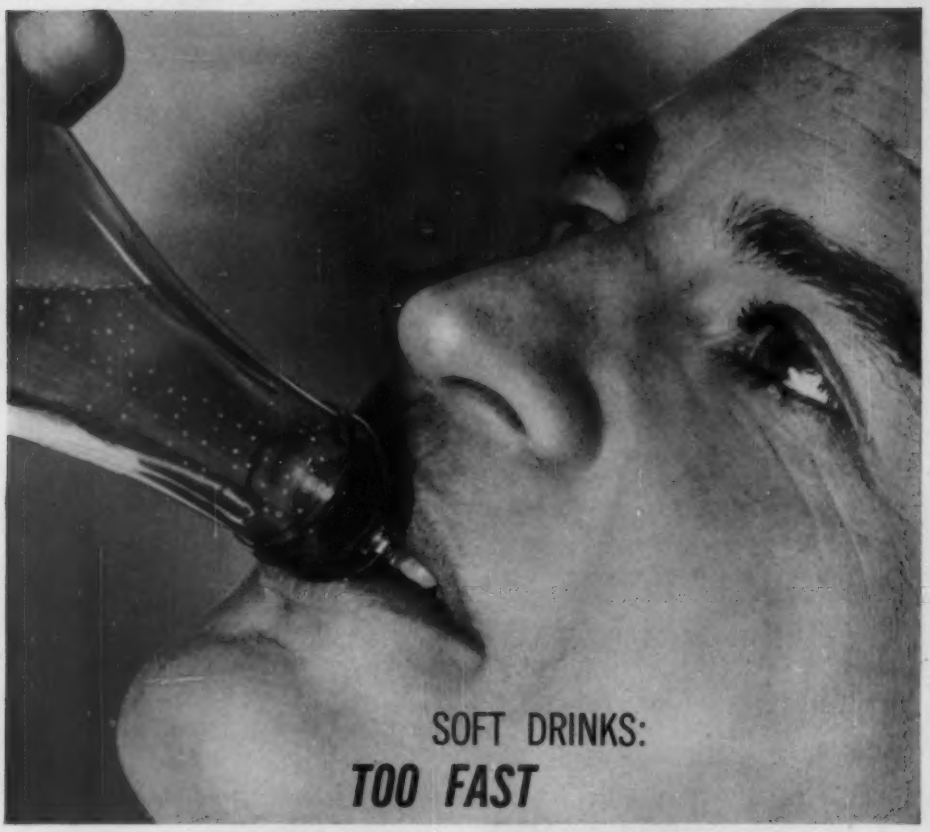

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* Shaw, Jas. H., Caries-producing Factors; a Decade of Dental Research, J. Am. Dent. A., 55:785 (Dec.) 1957.
Ludwig, T. G., and Bibby, B. G., Acid Production from Different Carbohydrate Foods in Plaque and Saliva; Further Observations Upon the Caries-Producing Potentialities of Various Foodstuffs, J. Dent. Research, 36:56 (Feb.) 1957.
Bibby, B. G., Effect of Sugar Content of Foodstuffs on Their Caries-Producing Potentialities, J. Am. Dent. A., 51:293 (Sept.) 1955.

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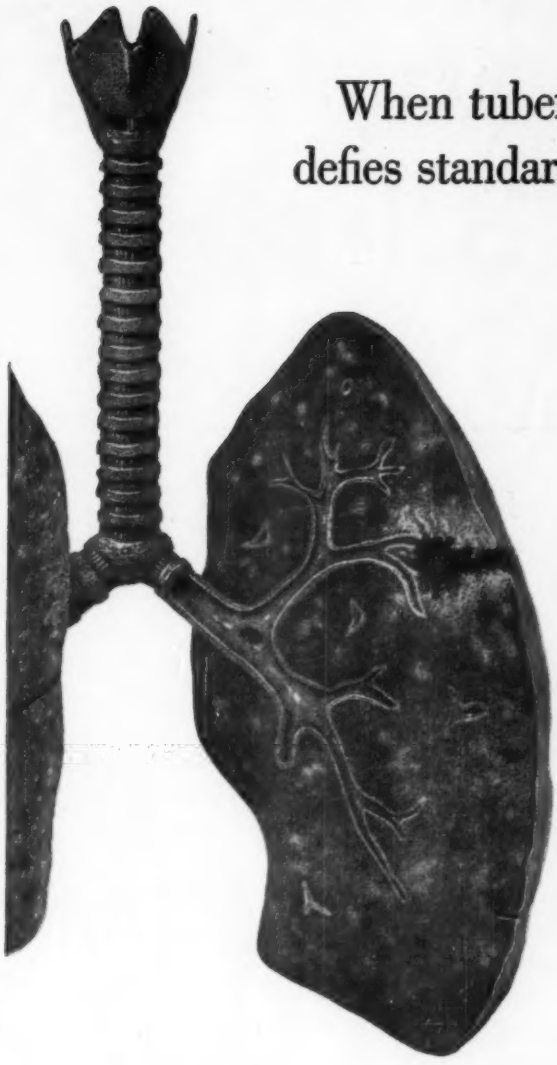

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PENICILLIN in MILK

Reliable *Sensitive* *Practical*

Direct assay method of Arret and Kirshbaum (FDA) for determining presence of penicillin in milk and dairy products.

Media	**BACTO — ANTIBIOTIC MEDIUM 1** **BACTO — SPORULATING AGAR**
Inoculum	**BACILLUS SUBTILIS ATCC 6633** Standardized Spore Suspension in 1 ml. ampuls
Penicillinase	**BACTO — PENASE CONCENTRATE** in 20 ml. and 100 ml. vials **BACTO — PENASE DISKS** Standardized Impregnated Disks
Penicillin	**STANDARDIZED IMPREGNATED DISKS** 0.05 unit, 0.1 unit and other concentrations

Information on request

DIFCO LABORATORIES

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